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UNITED STATES COAST AND GEODETIC SURVEY
O. H. TITTMANN
SUPERINTENDENT

UNITED STATES COAST PILOT

ATLANTIC COAST

PARTS I-II

FROM THE ST. CROIX RIVER TO CAPE ANN

SECOND EDITION

PRICE, 50 CENTS

WASHINGTON
GOVERNMENT PRINTING OFFICE
1903

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From the
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TREASURY DEPARTMENT,
UNITED STATES COAST AND GEODETIC SURVEY OFFICE,
WASHINGTON, D. C., *April 6, 1903.*

This volume covers the coast from the St. Croix River to Cape Ann, including the harbors and navigable inland passages.

This publication is based mainly upon the work of the Coast and Geodetic Survey, including the results of special examinations and investigations carried on in 1902 in connection with its preparation.

The system adopted in this publication includes—

I. A tabular description of all lighthouses, light-vessels, and fog signals; lists of life-saving stations, Weather Bureau storm warning display stations, and information regarding tides, tidal currents, variation of the compass, etc.

II. General information concerning the several bodies of water and harbors, including notes relative to pilots and pilotage, towboats, depth of water, draft of vessels entering, harbor and quarantine regulations, supplies, facilities for making repairs, usual or best anchorages, and other matters of practical interest. In each case the information of this nature precedes the sailing directions and is printed in smaller type.

III. Sailing directions, with subordinate paragraphs treating of prominent objects, dangers, aids to navigation, etc. In the arrangement adopted the aim has been to conform, as far as practicable, to the order in which these matters would be considered in practice, and to render available such information as may be wanted promptly. For this purpose, and to afford a ready means of reference from one part to another, the sailing directions, where long, are divided into numbered or lettered sections, printed in large type, each followed by its own subordinate remarks in smaller type.

IV. Appendices.

The first edition of this volume was prepared by Lieut. Commander S. M. Ackley, U. S. N., assisted by Ensign E. A. Anderson, U. S. N., and Mr. John Ross. In the present (second) edition the text has been revised and brought up to date by Mr. John Ross and Mr. Herbert C. Graves, under the general direction of Herbert G. Ogden, Assistant, Coast and Geodetic Survey, Inspector of Hydrography and Topography.

Great courtesy has been shown by local authorities in furnishing information desired for incorporation in this work.

The aids to navigation are correct to April 6, 1903.

As absolute accuracy in a work of this class is scarcely possible, navigators will confer a favor by notifying the Superintendent of the Coast and Geodetic Survey of errors which they may discover, or of additional matter which they think, for the good of mariners, should be inserted.

O. H. TITTMANN,
Superintendent.

NOTE.

All bearings and courses are *magnetic.*

All distances are in *nautical miles*, except where otherwise stated.

Except where otherwise stated, all depths are at *mean low water.*

In winter when whistling buoys, bell buoys, lighted buoys, can buoys, and nun buoys are in danger of being carried away by ice, they are taken up and replaced by spar or spar-shaped buoys.

It must be remembered that in the thoroughfares and inside passages the aids are colored and numbered for entering from eastward.

All charts referred to in this volume are published by the U. S. Coast and Geodetic Survey and can be obtained at the agencies, a list of which is found on pages 7–8.

SYSTEM OF BUOYAGE ADOPTED IN UNITED STATES WATERS.

The following order is observed in coloring and numbering the buoys in United States waters, viz:

1. In approaching the channel, etc., from seaward, RED BUOYS, with EVEN NUMBERS, will be found on the STARBOARD side of the channel, and must be left on the STARBOARD hand in passing in.

2. In approaching the channel, etc., from seaward, BLACK BUOYS, with ODD NUMBERS, will be found on the PORT side of the channel, and must be left on the PORT hand in passing in.

3. BUOYS painted with RED and BLACK HORIZONTAL STRIPES will be found on OBSTRUCTIONS, with channel ways on either side of them, and may be left on either hand in passing in.

4. BUOYS painted with WHITE and BLACK PERPENDICULAR STRIPES will be found in MID-CHANNEL and must be passed close-to to avoid danger.

All other distinguishing marks to buoys will be in addition to the foregoing, and may be employed to mark particular spots, *a description of which will be given in the printed list of buoys.*

Perches, with balls, cages, etc., will, when placed on buoys, be at turning points, the color and number indicating on what side they shall be passed.

Nun buoys, properly colored and numbered, are usually placed on the starboard side, and can buoys on the port side of channels.

Day beacons, stakes, and spindles (except such as are on the sides of channels, which will be colored like buoys) are constructed and distinguished with special reference to each locality, and particularly in regard to the background upon which they are projected.

Wherever practicable, the towers, beacons, buoys, spindles, and all other aids to navigation, are arranged in the buoy list in regular order *as they are passed by vessels entering from sea.*

The positions of the buoys mentioned in this volume are shown on the charts of the United States Coast and Geodetic Survey, which are kept corrected from information furnished by the Inspectors of the Lighthouse Districts, for the changes in the aids to navigation rendered necessary from time to time to indicate the best channels.

The following symbols and abbreviations are used on the charts of the Coast and Geodetic Survey:

◊ Red buoys, with even numbers, to be left on starboard hand in entering; if green, yellow, or white, the color is printed close to the buoy.

♦ Black buoys, with odd numbers, to be left on the port hand in entering.

◊ Black and white perpendicular stripes, without numbers, mid-channel or fairway buoys.

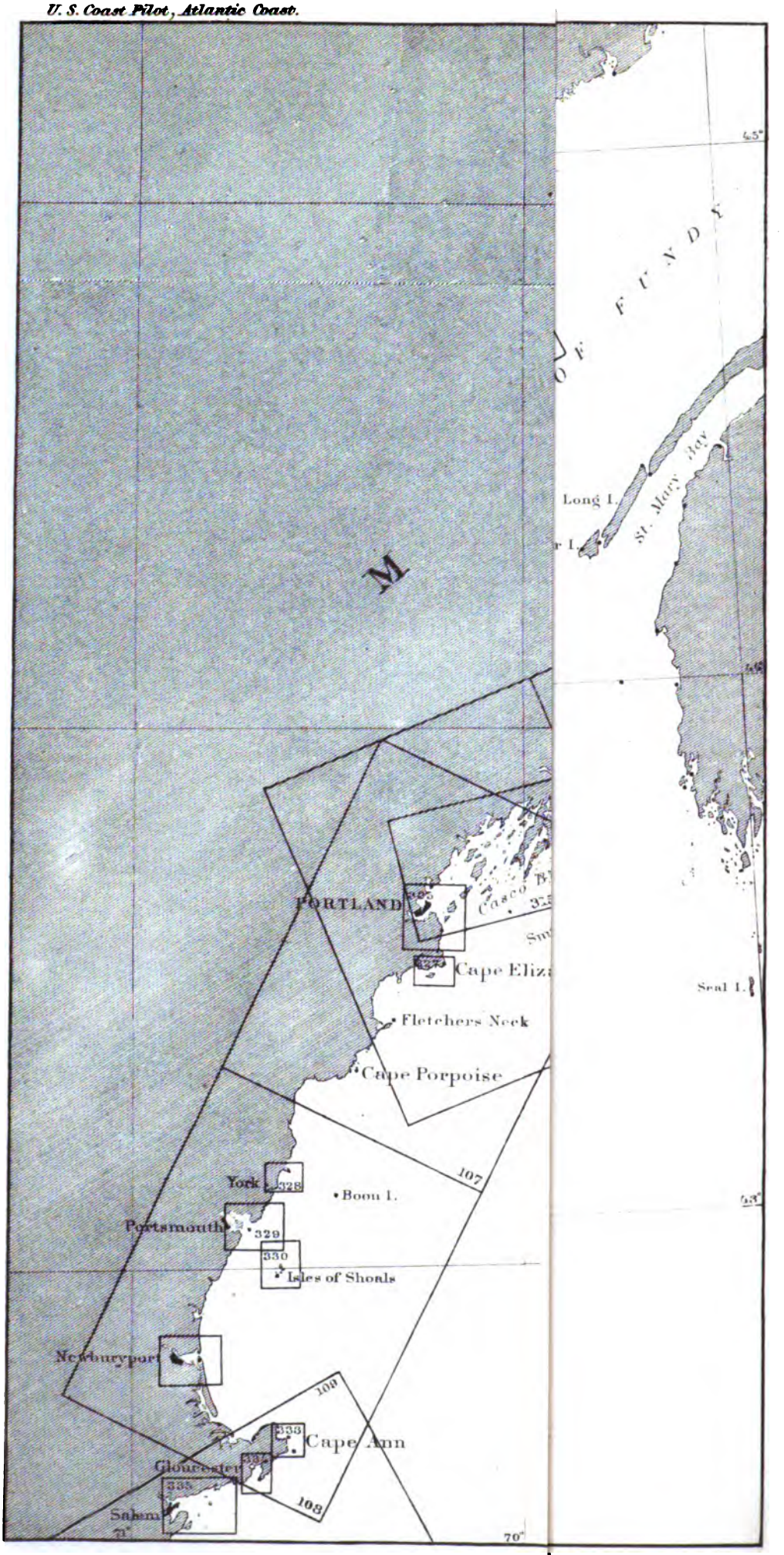
◊ or H. S., red and black horizontal stripes, without numbers, marking dangers or obstructions, to be left on either hand.

◊ Lighted buoys, different colors as above.

◊ ***WHISTLE,*** whistling buoys, different colors as above.

◊ ***BELL,*** bell buoys, different colors as above.

C., N., or S., signifies can, nun, or spar buoy.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Long I.
St. Mary Bay
PORTLAND
Casco
Cape Eliz
Seal I.
Fletchers Neck
Cape Porpoise
107
York
328
Boon I.
Portsmouth
329
330
Isles of Shoals
Newburyport
109
333
Cape Ann
Gloucester
335
Salem
108
70°

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GENERAL OUTLINE OF ARRANGEMENT.

This volume includes Parts 1 and 2 of the United States Coast Pilot, each part being arranged on the same general plan. The order in which this part of the coast has been treated is:

PART I.

1. The Gulf of Maine as a whole; general description of the coast from the St. Croix River to Whitehead; tables of lighthouses, tides, storm warning display stations, life-saving stations, bearings and distances, and the variation of the compass from the St. Croix River to Cape Ann.
2. General remarks on approaching the coast from seaward and sailing directions offshore and inshore from Quoddy Head to Cape Ann.
3. The estuaries and ports from the St. Croix River to Whitehead, with sailing directions, in detail.

PART II.

1. General description of the coast from Whitehead to Cape Ann.
2. The estuaries and ports from Whitehead to Cape Ann, with sailing directions in detail.

The appendices and index for both parts are at the end of the volume.

The descriptive matter and general information is in small type and precedes in every case the sailing directions.

Sailing directions, in large type, are numbered in sections in the order they would be required in practice, and when given for more than one approach or channel a letter is added to the numeral, thus: "Sailing directions, Machias Bay. Sec. 1. Approaching and entering, from eastward." "Sec. 1 A. Approaching and entering, from westward."

Unless otherwise stated in the text, the directions in section 2 should be followed immediately after sections 1, 1 A, or 1 B.

Each section contains also remarks, in fine type, relating to the principal objects that will be seen, and other information that may be of assistance to the navigator in locating his position; also a short description of the dangers and aids marking them, that will be found while following the sailing directions.

In some localties where frequent changes of course are necessary the directions are, on that account, made more general, and include the remarks, the whole being in large type.

The directions, in sections, along shore, through the inside passages, and entering the harbors are all numbered from eastward.

The following addenda include the changes which occurred to June 11, 1903, while this volume was in press:

PAGES 16-17.

Lubec Channel Lighthouse.—The color of the tower is changed from brown to white.

Crabtree Ledge Lighthouse.—The color of the tower is changed from brown to white.

PAGES 18-19.

Goose Rocks Lighthouse.—The color of the tower is changed from red to white.

PAGES 20-21.

Fort Popham Beacon.—This light is now shown from a white square pyramidal wooden structure, upper part inclosed, which is connected with the shore by a white wooden bridge about 70 feet long. A fog bell struck by machinery a single blow every 15 seconds is established.

PAGE 183.

Corwin Rock.—A bell buoy (black) is substituted for the buoy (nun, red and black horizontal stripes) marking Corwin Rock.

Alden Rock.—A buoy (nun, red) is substituted for the buoy (can, black) marking Alden Rock, and will be stationed about 300 yards **SSW.** of the rock.

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UNITED STATES COAST PILOT.

ATLANTIC COAST—PART I.

FROM THE ST. CROIX RIVER TO WHITEHEAD.

GULF OF MAINE.*

The great indentation of the coast between the British province of Nova Scotia on the north and Massachusetts on the south, which includes the Bay of Fundy and Massachusetts Bay as subsidiary features, has received the general designation "Gulf of Maine."

On account of its changeable weather, frequent fogs, and strong tidal currents this locality has a bad reputation among mariners. (For offshore current observations see Appendix I and chart facing it.)

The bottom in the Gulf of Maine is irregular and the depths are so variable that it is quite impossible to determine a vessel's position by soundings alone, but the navigator will find a frequent use of the lead of the greatest assistance in approaching both Georges and Browns banks from southward and eastward, the bottom slope on that side being well defined.

The principal offshore dangers are Nantucket Shoals; Georges and Cultivator shoals, both a part of Georges Bank; Sigsbee Rock, a part of Cashe Ledge, and Ammen Rock.

Browns Bank, with 27 to 50 fathoms of water over it, is about 40 miles south of Cape Sable, between latitude 42° 17′ and 42° 54′ **N.** and longitude 65° 12′ and 66° 28′ **W.** The bank is about 50 miles long in a **WNW.** and **ESE.** direction, and its greatest width is nearly 30 miles. About 44 miles **SW.** ⅝ **W.** from Cape Sable and near the western end of the bank is a spot with 14 fathoms over it.

Georges Bank is the extensive shoal (depth less than 50 fathoms) lying off the coast of Massachusetts eastward of Nantucket Shoals. The northeastern point of this bank is in latitude 42° 05′ **N.** and longitude 66° 05′ **W.**; from this the eastern edge trends in a general **SW.** by **S.** direction to latitude 41° 00′ **N.** and longitude 66° 38′ **W.**; the edge of the bank then takes a general **W.** by **S.** direction to longitude 68° 30′ **W.**, where it joins the 50-fathom curve which makes offshore. The greatest width **N.** and **S.** is about 80 miles. That part of the bank where depths of less than 20 fathoms will be found, including Georges and Cultivator shoals, lies between latitude 41° 06′ and 41° 58′ **N.** and longitude 67° 17′ and 68° 30′ **W.**; between these limits it is about 75 miles long in a **NE.** and **SW.** direction, and has several spots with 5 to 10 fathoms of water over them.

Georges Shoal is a dangerous shoal, with less than 10 fathoms over it, between latitude 41° 33′ and 41° 47′ **N.** and longitude 67° 38′ and 67° 53′ **W.** The shoalest water within these limits is 12 feet; in heavy weather the sea breaks here in 10 fathoms, and tide rips are found near the shoalest water, which extends about 9 miles in a **N.** and **S.** direction at the northern end of the shoal. The northern end lies 134 miles **SE.** ¾ **E.** from Cape Ann Lighthouses and 102½ miles **SE.** by **E.** ⅞ **E.** from Cape Cod Lighthouse.

Cultivator Shoal is about 8 miles long in a **NNE.** and **SSW.** direction, with a depth of 3 to 8 fathoms. It lies between latitude 41° 31′ 30″ and 41° 39′ **N.** and longitude 68° 10′ and 68° 14′ **W.**, and is about 19 miles westward of the shoalest part of Georges Shoal. The northern end of this shoal lies 88 miles **SE.** by **E.** ¼ **E.**, from Cape Cod Lighthouse.

A detached shoal, with 5¼ fathoms over it, lies in latitude 41° 11′ **N.**, longitude 68° 25′ 30″ **W.**; and another, with 5 fathoms over it, lies in latitude 41° 14′ **N.**, longitude 68° 00′ **W.** Between these and Cultivator Shoal are several shoal spots with 8 and 10 fathoms over them.

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*These waters fall within the limits of the following charts: **1000,** Sailing Chart, Mercator projection, Deg. Lat. = 3.7 inches; **6,** General chart of the coast, scale $\frac{1}{400,000}$; **101, 102, 103, 104, 105, 106, 107, 108,** scale $\frac{1}{80,000}$, price of each $0.50; and a number of harbor charts on a larger scale, as noted under the several headings; all charts referred to in footnotes are issued by the Coast and Geodetic Survey.

Coast and Geodetic Survey charts can be obtained from the agents named in the list given on pages 7 and 8. Facing page 8 is an index map showing the location and limits of charts covering that part of the coast included in this volume. The catalogue of charts and other publications of the Survey also contain similar index maps; copies of this catalogue can be obtained free of charge on personal application at any of the sale agencies or by letter addressed to the Coast and Geodetic Survey Office, Washington, D. C.

Nantucket Shoals is the general name of the numerous different broken shoals which lie southeastward of Nantucket Island and make this one of the most dangerous parts of the coast of the United States for the navigator. These shoals extend 23 miles eastward and 39 miles southeastward from Nantucket Island, are shifting in their nature, and the depths vary from 3 and 4 feet on some to 4 and 5 fathoms on others, while slues with depths of 10 fathoms or more lead between those farthest offshore. The southeasternmost of these shoals (*Phelps Bank*) has a least depth of 10 fathoms. *Asia Rip*, a part of this bank, lies 40 miles **SSE.** ⅛ **E.** from Sankaty Head Lighthouse and 14¼ miles **NE.** by **E.** from Nantucket Shoals Light-vessel, in latitude 40° 47′ 30″ **N.**, longitude 69° 23′ **W.** *Fishing Rip*, with depths of 4 to 8 fathoms over it, is about 5½ miles long in a **NNE.** ½ **E.** and **SSW.** ½ **W.** direction; the middle of the rip lies 29 miles **SE.** from Sankaty Head Lighthouse. This rip is on the easterly edge of Nantucket Shoals, and there is a depth of 6¾ fathoms about 5 miles **SSW.**, and spots with 4½ to 7½ fathoms extend for a distance of 19 miles northward, from the middle of the rip along the eastern edge of the shoals. The depth between Fishing Rip and Asia Rip is 10 to 27 fathoms. *Davis South Shoal* is near the southwestern part of Nantucket Shoals; it has a least depth of 15 feet; the middle of the shoal lies 20 miles **S.** ⅛ **E.** from Sankaty Head Lighthouse. Soundings of 5¾ to 8 fathoms will be found for a distance of 8 miles southwestward of the shoal. The broken shoals and rips lying northward of Davis South Shoal and northwestward of Fishing Rip have depths ranging from 3 feet to 5½ fathoms over them. The tidal currents are strong, and variable in direction, forming extensive rips and broken water over the shoals.

Nantucket Shoals Light-vessel, the leading mark for vessels passing southward of Nantucket Shoals, is moored in 30 fathoms of water off the southern end of the shoals (see chart facing Appendix I).

Cashe Ledge lies 74 miles **E.** ⅛ **S.** from Cape Ann Lighthouses, and the part over which the depth is less than 30 fathoms is about 6½ miles long in a **NNE.** and **SSW.** direction. *Sigsbee Rock*, with a depth of 5 fathoms over it, is near the middle of the ledge in latitude 42° 53′ 30″ **N.**, longitude 69° 54′ 10″ **W.** *Ammen Rock*, with a depth of 4¼ fathoms over it, lies 4 miles **NE.** ½ **E.** from Sigsbee Rock. The sea breaks over these rocks in heavy weather.

Jeffrey Bank has a least depth of 46 fathoms, and lies about 26 miles southward of Matinicus Rock Lighthouses.

Platts Bank has a least depth of 29 fathoms.

Jeffrey Ledge makes northeastward from Cape Ann, and has a least depth of 18 fathoms over it. The northeastern point of the ledge is 22 miles **E.** ½ **S.** from Boon Island Lighthouse.

Stellwagen Bank lies northward of Cape Cod and off the entrance to Massachusetts Bay; the depth over it is from 9½ to 20 fathoms.

BAY OF FUNDY.*

This is a large arm making northeastward from the Gulf of Maine between Nova Scotia and New Brunswick; the entrance, between Brier Island, Nova Scotia, and Libby Island, Maine, is about 46 miles wide. Grand Manan Island and its outlying islands and ledges divide the entrance into two passages, the one westward of the island, between it and the coast of Maine, being known as *Grand Manan Channel.*

The Bay of Fundy has deep water, and the shores are comparatively bold. The tidal currents run with great velocity. At the head of the bay the rise of tide is from 40 to 50 feet, the flood coming in generally in a "bore" or tidal wave. The frequent changes of weather, the set of the current, and the thick, long-continued fogs make the navigation of the bay hazardous even to the most experienced navigator.

GRAND MANAN CHANNEL.†

This channel leads along the coast of Maine between it and Grand Manan Island, and is an approach, from westward, to Quoddy Roads and Passamaquoddy Bay, and the most direct passage for vessels bound up the Bay of Fundy from along the coast of Maine. The channel varies in width from 5½ miles abreast Campobello Island to 10 miles abreast Southwest Head, the southwestern point of Grand Manan Island. Its western approach is marked by Machias Seal Island Lighthouses, which also mark the westernmost of the rocks and ledges which lie southwestward of Grand Manan Island. With the exception of the dangers between Machias Seal Islands and Grand Manan Island the channel is free and has a good depth of water. The tidal currents have a velocity of 2½ to 3 miles and follow the general direction of the channel. Off West Quoddy Head the currents set in and out of the roads, forming strong rips. Vessels should not approach West Quoddy Head too closely with a light wind.

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* Shown in part on charts **1000**, Mercator projection, Deg. Lat. = 3.7 inches; **6**, scale $\frac{1}{400,000}$, price of each $0.50.

† Shown on chart **101**, scale $\frac{1}{80,000}$, price $0.50.

COAST OF MAINE FROM THE ST. CROIX RIVER TO WHITEHEAD.*

This stretch of coast, 108 miles long in a straight line from West Quoddy Head to Whitehead, is generally rocky and indented by numerous large bays and many excellent harbors. Numerous islands lie along the shore, among which there are passages that are much used by vessels, usually of less than 12 feet draft, as they afford anchorage in a head wind, or in thick weather. The many sunken rocks and ledges which lie along and off this coast require the closest attention of the navigator, as in many cases they rise abruptly from deep water and the lead does not always give indications of their proximity until too late to avoid them. The navigator should also remember that the average rise of spring tide at Rockland is 11 feet, at Millbridge, 13 feet, and at Eastport 21 feet, and that a vessel may sometimes pass over places at high water on which she would bring up at low water.

The most important **harbors and anchorages** are: Calais, St. Croix River; Eastport, Friar Roads; Cutler, Little River; Machiasport, Machias Bay; Millbridge, Narraguagas Bay; Winter Harbor, Bar Harbor, and Stave Island Harbor, all in Frenchman Bay; Southwest Harbor; Bass Harbor; Castine, Belfast, Camden, Rockport, and Rockland in Penobscot Bay, and Bangor and Bucksport in Penobscot River. There are many other harbors and anchorages which are treated under the different headings.

Prominent features.—The coast between West Quoddy Head and Little River presents no special features; westward of Little River the shore is broken by bays and islands, and continues to be so to Whitehead. *Grand Manan Island* has nearly perpendicular, dark, rocky faces about 200 feet high on its western side. *Pigeon Hill*, on the western side of Pigeon Hill Bay, near the head, is 307 feet high. *Schoodic Mountain*, near the south end of Schoodic Peninsula, the eastern point at entrance to Frenchman Bay, is 437 feet high. *Green Mountain*, the highest on Mount Desert Island, is 1,532 feet high and the most prominent landmark on this part of the coast. *Isle au Haut* is 556 feet high near its northern end, and is on the eastern side of the entrance to East Penobscot Bay. The *Camden Hills* (Mount Megunticook, 1,320 feet) are on the western side of Penobscot Bay, above the town of Camden.

Aids to navigation.—At night, in clear weather, no difficulty should be experienced in approaching or standing along the coast, as the lighthouses are numerous and readily distinguished (see table, pages 16–23). Many of the most important outlying dangers are marked by buoys or spindles. The buoyage accords with the system adopted for U. S. waters (see page 5). In the thorofares the aids are numbered and colored for entering from eastward.

Pilots.—Most of the piloting into the harbors and through the thorofares on this part of the coast is done by local fishermen. Pilotage is not compulsory (see extracts from Revised Statutes of Maine, Appendix II). Little River, Maine, is a rendezvous for the St. John, New Brunswick, pilots, who are frequently employed by vessels passing there and bound eastward, to ports in Maine and the British provinces. Pilots from the British provinces can take vessels into Maine ports, but Maine pilots are not permitted to take vessels into ports in the provinces, as pilotage is compulsory there. See also "Pilots," under the different headings.

Towboats are to be had in the St. Croix River, in Machias River, and in Penobscot River. See also "Towboats," under heading Rockland Harbor.

Quarantine.—The quarantine laws of Maine govern the ports of the State; local municipal officers have the power to make quarantine regulations for the ports under their control. (See Appendix II.)

Harbor control.—See Appendix II.

Marine Hospital.—Relief stations of Class III of the U. S. Public Health and Marine Hospital Service are at Bangor and Machias, and relief stations of Class IV are at Ellsworth and Rockland; at each of these places an acting assistant surgeon of the service is stationed. At Belfast, Castine, and Eastport are emergency relief stations of Class IV. (See Appendix IV.)

Rules of the Road are given in Appendix V.

Lines within which the Inland Rules of the Road apply.—*Cutler (Little River) Harbor, Maine.* A line drawn from Long Point **SW.** by **W.** ¼ **W.** to Little River Head.

A line drawn from Little River Head **WSW.** ¼ **W.** to the outer side of Old Man; thence **WSW.** ⅝ **W.** to the outer side of Double Shot Islands; thence **W.** ¾ **S.** to Libby Islands Lighthouse; thence **WSW.** ¼ **W.** to Moose Peak Lighthouse; thence **WSW.** ¼ **W.** to Little Pond Head; from Pond Point, Great Wass Island, **W.** by **S.** to outer side of Crumple Island; thence **W.** ⅝ **S.** to Petit Manan Lighthouse.

A line drawn from Petit Manan Lighthouse **SW.** ⅝ **S.**, 26¼ miles, to Mount Desert Lighthouse; thence **W.** ⅝ **S.**, 33¼ miles, to Mantinicus Rock Lighthouse; thence **WNW.** ⅞ **W.**, 20 miles, to Monhegan Island Lighthouse; thence **W.**, 21 miles, to Seguin Island Whistling Buoy; thence **W.** ¾ **S.**, 19 miles, to Old Anthony

*Shown on charts **6**, scale $\frac{1}{400,000}$; **101, 102, 103,** and **104**, scale of each $\frac{1}{80,000}$, price of each $0.50.

TABLE OF LIGHTS.

Lighthouse Districts, Etc.—The coast and the waters covered by this volume lie within the **First and Second Lighthouse Districts** of the United States. These districts extend from St. Croix River, Maine, to Warren Point, Rhode Island. The Light list for the Atlantic and Gulf coasts of the United States and the Buoy list for the First and Second Districts give full descriptions of the aids to navigation.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
		° ′ ″				
1	Whitlocks Mill	45 09 (47) 67 13 (41)	Fixed red	Post lantern.	29	-------
2	St. Croix River	45 07 44 67 08 03	Fixed white varied by a white flash every 30 seconds.	5	76½	12¾
3	Lubec Channel	44 50 32 66 58 39	Flashing white every 15 seconds	5	52½	12¾
4	West Quoddy Head	44 48 55 66 57 04	Fixed white	3	83	14¾
5	Little River	44 39 03 67 11 34	Fixed white varied by a white flash every 90 seconds.	5	57	13
6	Avery Rock	44 39 16 67 20 41	Fixed red	4	53½	11¼
7	Libby Islands	44 34 06 67 22 04	Fixed white; *obscured through an arc of about 1½° when bearing about ENE.*	4	91	15¼
8	Moose Peak	44 28 28 67 31 57	Flashing white every 30 seconds	2	72	14
9	Moosabec Reach	44 31 (46) 67 33 (56)	Fixed red	Lens lantern.	20	-------
10	Nash Island	44 27 52 67 44 52	Fixed red	4	51¼	11¼
11	Narraguagus	44 27 22 67 49 55	Fixed white	5	54	12¾
12	PETIT MANAN	44 22 04 67 51 53	Fixed white varied by a white flash every 2 minutes.	2	123	16
13	Prospect Harbor	44 24 (12) 68 00 (48)	Flashing alternately red and white; interval between flashes 30 seconds.	5	41½	11¾
14	Winter Harbor	44 21 41 68 05 18	Fixed white	5	37	11¼
15	MOUNT DESERT	43 58 08 68 07 44	Flashing white every 15 seconds	4	75	14¼
16	Egg Rock	44 21 (15) 68 08 (19)	Flashing red every 5 seconds	4	64	13½
17	Crabtree Ledge	44 28 20 68 13 18	Fixed white varied by a white flash every 2 minutes.	5	48½	12¼
18	Baker Island	44 14 29 68 11 59	Fixed white varied by a white flash every 90 seconds.	4	105	16
19	Great Duck Island	44 08 32 68 14 47	Flashing red every 10 seconds	4	66½	13¾
20	Bear Island	44 17 (00) 68 16 (14)	Fixed white	5	99½	12¾
21	Bass Harbor Head	44 13 19 68 20 16	Fixed red	4	56	11¼
22	Burnt Coat Harbor	44 08 03 68 26 52	Fixed white	4	75	14¼
23	Blue Hill Bay	44 14 56 68 29 54	Fixed white	5	26	10¼
	EAST PENOBSCOT BAY:					
24	Saddleback Ledge	44 00 52 68 43 37	Fixed white	5	54	12¾
25	Deer Island Thorofare	44 08 04 68 42 14	Fixed white	4	52	12½

ST. CROIX RIVER TO CAPE ANN.

These pamphlets, which are corrected and reprinted from time to time, are sent free of charge to any shipmaster on application to the office of the Lighthouse Board, Washington, D. C., or to the Inspector of the First Lighthouse District, Custom-House, Portland, Me., and Inspector of the Second Lighthouse District, Post-Office Building, Boston, Mass. They can also be had on application at the United States Branch Hydrographic Office at Boston, Mass.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
1	Lantern suspended from a pole		
2	Lantern on white dwelling	33	Bell struck by hand in answer to signals.
3	Brown conical tower; lantern, black; on black cylindrical foundation pier expanding in trumpet-shape under main gallery; gallery covered by roof.		Bell struck by machinery every 10 seconds.
4	Tower painted with red and white horizontal bands, brick service room attached. A white double dwelling 8 feet W.; a white barn NW. ¾ W.; a white brick fog-signal house, 80 feet SW.; a red-brick oilhouse 210 feet NE., and a white signal mast 140 feet SSW. from the light-tower.	42	10-inch steam whistle; blasts 3 seconds, one silent interval 7 seconds, two silent intervals 22 seconds. If whistle be disabled a bell will be rung by hand.
5	White, conical, iron tower, detached from white frame dwelling. White pyramidal bell-tower, about 150 feet SSE.	35	Bell struck by machinery every 30 seconds.
6	White square tower, rising from middle of square, white, one-story dwelling. Bell-tower and boathouse near by. A timber bulkhead extends across the southerly side of the rock.	34	Bell struck by machinery every 10 seconds.
7	Conical, gray granite tower, detached from white dwelling and rain shed. White fog-signal house on southerly point of island, and a red-brick oilhouse about 100 feet N. of tower.	36	10-inch steam whistle; blasts 2 seconds, silent intervals 13 seconds.
8	White tower, with brick annex and a covered way extending to a white dwelling. Red-brick oilhouse about 250 feet NW. of dwelling, and a white signal mast 188 feet SSW. from light-tower.	45¾	Hand bell rung in answer to signals
9	Lantern suspended from red iron spindle		
10	White square tower and dwelling, connected by a porch and workroom. A pyramidal bell-tower at NW. side of tower. Red-brick oilhouse, 190 feet SE. by E. ¾ E. from light-tower.	29½	Bell struck by machinery a single and a double blow alternately, intervals 20 seconds.
11	White tower, connected with white dwelling by a workroom	36¾	Bell struck by hand in answer to signals.
12	Gray granite tower, with cluster of white buildings near. White fog-signal house on the southerly point of the island.	107	10-inch steam whistle; blasts 5 seconds, alternate silent intervals 15 and 35 seconds. If whistle be disabled a bell will be rung by hand.
13	White, conical shingled tower, 25 feet S. from a white dwelling; white fuel house and a barn near dwelling on northerly side, and a white boathouse 432 feet NW. by W. ⅞ W. from light-tower.	31½	Hand bell rung in answer to signals.
14	White tower and dwelling, connected by workroom and porch	19	Hand bell rung in answer to signals.
15	Conical, gray granite tower. Two white dwellings near. Pyramidal skeleton bell-tower, about 275 feet SSW. of light-tower. Red-brick oilhouse near base of light-tower, on westerly side.	51	3d-class Daboll trumpet, blasts 5 seconds, one silent interval 25 seconds, two silent intervals 10 seconds. If trumpet be disabled a bell will be rung by hand.
16	White square tower, rising from middle of square white dwelling. Bell-tower close to SW. side of dwelling.	34	Bell struck by machinery a double blow every 20 seconds.
17	Black cylindrical foundation pier, surmounted by a brown conical tower. A gallery, with roof, surrounds base of tower.		Bell struck by machinery every 10 seconds.
18	White tower and dwelling, connected by workroom. A red-brick oilhouse, 100 feet NW. from tower.	37	
19	White, cylindrical, brick tower, near brick fog-signal house and rain shed, and about 250 feet southerly from row of three white dwellings; a stone oilhouse about 125 feet W. ⅝ N. and a white boathouse on shore westerly from light-tower.	35½	10-inch steam whistle; blasts 5 seconds, alternate silent intervals 20 and 30 seconds.
20	Tower with workroom annexed, painted white, and brown frame dwelling. White pyramidal bell-tower near brow of hill, about 200 feet SSE. of light-tower.	24½	Bell struck by machinery every 15 seconds.
21	White tower and dwelling, connected by porch. White boathouse 64 feet NW. by W. ½ W.; small red-brick fog-signal house, near edge of bank, 19 feet SE. ⅜ E.; and red-brick oilhouse 205 feet northwesterly from tower,	26	Bell struck by machinery every 10 seconds.
22	Square white tower, connected with white dwelling. Red-brick oilhouse 110 feet NNE., white boathouse and slip 115 feet N. by E. of tower.	32½	Hand bell rung in answer to signals.
23	White tower connected with dwelling by a workroom. White pyramidal bell-tower 100 feet NE. ⅛ N. from light-tower.	22	Bell struck by machinery a single and a double blow alternately, intervals 20 seconds.
24	Gray granite tower with white base. White frame building attached, and a pyramidal skeleton bell-tower on southerly side.	36	Bell struck by machinery every 10 seconds.
25	White square tower, attached to a white dwelling. Fog-bell tower red. Red-brick oilhouse 91 feet NE. of light-tower.	26	Bell struck by machinery a double blow every 15 seconds.

TABLE OF LIGHTS.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
	EAST PENOBSCOT BAY—Continued.	° ′ ″				
26	Goose Rocks	44 08 (08) 68 49 (52)	Flashing red with a flashing white sector between NW. ¾ W. and NW. ¾ N.; interval between flashes 5 seconds.	4	50½	12½
27	Eagle Island	44 13 04 68 46 06	Fixed white	4	106	16
28	Pumpkin Island	44 18 33 68 44 36	Fixed white	5	43½	12
29	HERON NECK	44 01 31 68 51 45	Fixed red	5	92	8½
30	MATINICUS ROCK (N.)	43 47 (03) 68 51 (21)	Fixed white	3	85	15
31	MATINICUS ROCK (S.)	43 47 01 68 51 20	Fixed white	3	90	15¼
32	TWO-BUSH ISLAND	43 57 (52) 69 04 (28)	Flashing red between SSW. ¾ W. and W. ⅝ S.; flashing white between W. ⅝ S. and ENE. ¾ E.; interval between flashes 5 seconds.	4	65	13.63
33	WHITEHEAD	43 58 43 69 07 30	Fixed white	3	74½	14¼
	WEST PENOBSCOT BAY:					
34	Owls Head	44 05 32 69 02 40	Fixed white	4	99½	15¾
35	Rockland Breakwater	44 06 (14) 69 04 (39)	Flashing white every 5 seconds	4	39	11½
36	Browns Head	44 06 42 68 54 36	Fixed white with a fixed red sector between N. by E. ½ E. and NE. by E. ¾ E., and another between ENE. ⅞ E. and ESE. ⅛ E.	4	39	11½
37	Indian Island	44 09 (55) 69 03 (23)	Fixed red	4	53¼	11¼
38	Negro Island	44 12 05 69 02 57	Fixed white	4	52	12½
39	Grindel Point	44 16 54 68 56 36	Fixed white	5	38¼	11½
	EAST PENOBSCOT BAY:					
40	Dice Head	44 22 58 68 49 11	Fixed white	4	130	17¼
41	Fort Point	44 28 02 68 48 44	Fixed white	4	87¾	15
42	Tennant Harbor	43 57 40 69 11 07	Fixed red varied by a red flash every minute.	5	64¼	13½
43	Marshall Point	43 55 03 69 15 42	Fixed white	5	29½	10½
44	MONHEGAN ISLAND	43 45 53 69 18 59	Flashing white every minute	2	178¼	19½
45	Manana Island Fog-Signal Station	43 45 47 69 19 37				
46	Franklin Island	43 53 32 69 22 31	Fixed white varied by a white flash every 90 seconds.	4	56¾	13
47	PEMAQUID POINT	43 50 13 69 30 23	Fixed white	4	78¾	14½
48	Ram Island	43 48 (14) 69 35 (54)	Fixed red with a fixed white sector between W. ¼ N. and W. ¾ N., and another between NE. ¼ N. and NE. by E. ¾ E.	4	35½	11¼
49	Burnt Island	43 49 31 69 38 27	Flashing red with a flashing white sector between NW. ½ N. and NNW. ¾ W., and another between N. ¾ E. and N. by E. ⅞ E.; interval between flashes 5 seconds.	4	61	13¼

ST. CROIX RIVER TO CAPE ANN.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
26	Black cylindrical foundation pier surmounted by a red conical tower. A gallery, with roof, surrounds base of tower.	----------	Bell struck by machinery a single and a double blow alternately, intervals 20 seconds.
27	White tower, dwelling attached. Red-brick oilhouse 169 feet WSW. of tower. Long flight of white steps on bluff W. of tower.	28	Hand bell rung in answer to signals.
28	White tower and dwelling, connected by a workroom	22	Hand bell rung in answer to signals.
29	White tower, connected by a workroom with white dwelling	22	Hand bell rung in answer to signals.
30 31	Two cylindrical, granite towers, with one dwelling of granite, natural color, and two dwellings of wood, painted white. A brick fog-signal house and a brick oilhouse SW. of and near southerly tower.	52 41	10-inch or 12-inch steam whistle; blasts 5 seconds, silent intervals 25 seconds. If whistle be disabled a bell will be struck by hand.
32	Square, pyramidal, red-brick tower; red-brick workroom and fog-signal room attached to base; black lantern; white wooden dwelling, with lead-colored trimmings, 40 feet NE. ¾ E., and red-brick oilhouse 125 feet NNW. ¼ W. from the tower. White boathouse on northwesterly shore of island.	36	Bell struck by machinery a double blow every 20 seconds.
33	Gray granite tower, red-brick service room attached, near a white frame dwelling. Red-brick fog-signal house about 115 feet S. and red-brick oilhouse about 250 feet NW. of dwelling; temporary white dwelling 145 feet NW. by W. ⅛ W. from the tower. Signal Service flagstaff to northwestward of tower.	34	10-inch steam whistle; blasts 5 seconds, silent intervals 25 seconds. If whistle be disabled a bell will be rung by hand.
34	White tower, detached from a white dwelling. Fog-signal house on bluff 100 feet NE. of light-tower. Red-brick oilhouse 82 feet S. by W. of light-tower	19	Bell struck by machinery every 15 seconds. If machinery be disabled a bell will be rung by hand.
35	Square red-brick tower, surmounted by black lantern, forming southwest corner of a red-brick fog-signal house, on a gray granite pier, 8 feet high, capping the breakwater. White dwelling, with shingled sides and slate roof, and a white boathouse, attached to fog-signal house on northerly side. Station inclosed by railing around pier.	----------	First-class Daboll trumpet; blasts 5 seconds, silent intervals 15 seconds.
36	White cylindrical tower and white dwelling, connected by workroom. White boathouse and boatslip 50 feet N. by E. from tower.	14¼	Bell struck by hand in anwer to signals.
37	White square tower, with white dwelling SW. of and close to it	30½	Hand bell rung in answer to signals.
38	White tower and dwelling, covered way extending nearly to dwelling. Red-brick oilhouse 203 feet NW. of light-tower. Small white bell-tower near the easterly side of light-tower.	24½	A 1,000-pound bell struck by hand in answer to signals.
39	White square tower and dwelling, connected by a covered way. Small white bell-tower near the westerly side of light-tower.	32¾	A 1,000-pound bell struck by hand in answer to signals.
40	White tower and dwelling, connected by a workroom. Red-brick oilhouse 77 feet SE. by S. from tower.	45	Bell struck by hand in answer to signals.
41	White square tower and dwelling, connected by a workroom; pyramidal white bell-tower about 250 feet ENE. and red-brick oilhouse 100 feet W. by S. from light-tower.	26	Bell struck by machinery every 10 seconds.
42	White tower and dwelling, connected by a workroom. White fuel house 100 feet W. by S. of tower.	27¾	Hand bell rung in answer to signals.
43	White tower, with a covered way extending nearly to white dwelling, and white pyramidal bell-tower 114 feet NE. by E. ¾ E. from light-tower.	25¼	Bell struck by machinery every 20 seconds.
44	Conical, gray granite tower with brick service room attached, connected with a white dwelling by white covered way. Another white dwelling stands to the southward and a red-brick oilhouse about 100 feet NW. of the tower.	36	----------
45	A brick fog-signal house, with two white dwellings, respectively, 2 and 43 feet northerly.	----------	First-class Daboll trumpet; blasts 10 seconds, silent intervals 20 seconds. If trumpet be disabled a bell will be struck by hand.
46	White tower and dwelling, connected by a workroom. Red-brick oilhouse 191 feet E. ½ N. from tower.	35½	Hand bell rung in answer to signals.
47	White tower and dwelling, connected by a workroom. Red-brick oilhouse 188 feet SW. by W. ½ W., and small red-brick fog-signal building, near the edge of the bank, 80 feet SW. ¾ S. from the light-tower.	32	Bell struck by machinery every 10 seconds.
48	Tower of granite to height of 20 feet, white above; connected with shore by an open bridge. White dwelling on shore near end of bridge. Bell on the northwesterly side of tower; red-brick oilhouse 500 feet SE. from tower.	39¼	Bell struck by machinery a single blow every 20 seconds.
49	White conical tower and white dwelling, connected by a covered way and porch. White pyramidal bell-tower, 60 feet SE. ¼ S., and red-brick oilhouse 168 feet NNW. from light-tower.	25½	Bell struck by machinery a double blow every minute.

TABLE OF LIGHTS.

Number.	Name.	Latitude north. Longitude west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible in nautical miles.
		° ′ ″				
50	Cuckolds Fog-Signal Station	43 46 (46) 69 39 (00)				
51	Hendricks Head	43 49 22 69 41 25	Flashing white every 30 seconds	4	42½	11¾
	KENNEBEC RIVER:					
52	Pond Island	43 44 24 69 46 15	Fixed white	5	52	12¾
53	Fort Popham Beacon	43 45 (17) 69 46 (58)	Fixed red	Lens lantern.	25	
54	Perkins Island	43 47 (13) 69 47 (09)	Fixed red with a fixed white sector between NNE. ¾ E. and NE. ⅝ E., and another between S. ⅛ W. and S. by W. ¼ W.	5	41	8½
55	Squirrel Point	43 49 (00) 69 48 (11)	Fixed red with a fixed white sector between NNW. and N. by W. ⅛ W.	5	25	8½
56	Range. Doubling Point Front	43 52 (58) 69 47 (47)	Fixed white	Refl'r.	18	
57	Range. Doubling Point Rear	43 53 (05) 69 47 (47)	Fixed white	Refl'r.	33	
58	Doubling Point	43 52 (58) 69 48 (25)	Fixed red	5	33	8½
59	Range. Abagadasset Point Front Beacon		Fixed red	Post lantern.	25	
60	Range. Abagadasset Point Rear Beacon		Fixed red	Post lantern.	30	
61	Ames Ledge	44 01 (16) 69 48 (53)	Fixed red	Post lantern.		
62	SEGUIN	43 42 26 69 45 32	Fixed white	1	180	19¾
	CASCO BAY:					
63	*Cape Elizabeth Light-Vessel, No. 74*	43 31 (30) 70 05 (38)	One fixed red One fixed white	Lens lantern.	33 45	11 12
64	HALFWAY ROCK	43 39 22 70 02 14	Fixed white varied by a red flash every 90 seconds.	3	75¾	14¼
65	CAPE ELIZABETH (E.)	43 33 58 70 12 02	Fixed white	1	128½	17¼
66	CAPE ELIZABETH (W.)	43 33 51 70 12 11	Fixed white varied by a white flash every minute.	2	129¾	17¼
67	PORTLAND HEAD	43 37 23 70 12 30	Fixed white	2	101	15¾
68	Spring Point Ledge	43 39 (09) 70 13 (28)	Flashing white between N. by W. $\frac{9}{16}$ W. and N. $\frac{15}{16}$ W.; and between E. ¼ N. and NW. by W. $\frac{9}{16}$ W.; flashing red throughout the intervening sectors. Interval between flashes 5 seconds.	5	54	12¾
69	Portland Breakwater	43 39 20 70 14 07	Fixed red varied by a red flash every 40 seconds.	5	29¾	10½
70	Wood Island	43 27 (24) 70 19 (46)	Fixed red varied by a red flash every minute.	4	70½	14
71	Goat Island	43 21 (28) 70 25 (32)	Fixed white	6	38	11
72	CAPE NEDDICK	43 09 (55) 70 35 (29)	Fixed red	4	87½	11¼
73	BOON ISLAND	43 07 17 70 28 37	Fixed white	2	133	17½

ST. CROIX RIVER TO CAPE ANN.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
50	White, half-round, stone pier, surmounted by half-round, white, brick, fog-signal building with high conical roof, shingled, natural color. White, one-and-one-half story, wooden dwelling attached to pier and fog-signal building on northwesterly side, protected on easterly side, to half height of first-story windows, by a bulkhead extending from stone pier to outbuildings in rear of dwelling.	----------	Daboll trumpet; blasts 3 seconds, silent intervals 17 seconds. If trumpet be disabled a bell will be struck by hand.
51	White square tower and dwelling; pyramidal white bell-tower, near water's edge to westward; all connected by covered ways. Red-brick oilhouse 247 feet NE. ⅞ N. from light-tower.	33¼	Bell struck by machinery every 20 seconds.
52	White tower and dwelling, connected by a workroom. Fog bell hung from framework, 200 feet S. of tower.	16½	Bell struck by machinery every 10 seconds.
53	Black iron spindle	----------	----------
54	White octagonal, pyramidal, shingled tower; black lantern; white dwelling 44 feet S. by E. ⅛ E., white barn 65 feet northeasterly, and a white boathouse 25 feet northerly; white bell-tower 236 feet southerly from light-tower.	17	Bell struck by machinery a single and a double blow alternately, intervals 15 seconds.
55	White, octagonal, pyramidal, shingled tower; black lantern; white dwelling 114 feet NE. ⅛ E., white barn 153 feet NE. ½ E., and a white boathouse 200 feet northerly from tower.	17	Bell struck by machinery every 15 seconds.
56	White, octagonal, pyramidal, shingled tower; white dwelling 175 feet NW. ¼ N., white barn 250 feet NW. ⅛ W., and a white boathouse 225 feet westerly from tower.	17	----------
57	White, octagonal, pyramidal, shingled tower; red-brick oilhouse 170 feet northerly from tower.	13	----------
58	White, octagonal, pyramidal, shingled tower, on square gray granite pier; black lantern; footbridge from pier to shore; fog-bell suspended from westerly side of tower; white dwelling with white barn near, 220 feet northeasterly, and a white boathouse about 400 feet northerly from tower.	17	Bell struck by machinery every 15 seconds.
59	Red mast	----------	----------
60	Red mast	----------	----------
61	Red wooden spindle	----------	----------
62	Gray, cylindrical, granite tower, connected with dwelling by a workroom. A brick fog-signal building and white frame dwelling about 250 feet S. of tower. Oilhouse, barn, and outbuildings to northward. An elevated car track extends in a generally northeasterly direction from the fog-signal building to the boat landing.	42	10-inch steam whistle; blasts 5 seconds, silent intervals 15 seconds. If whistle be disabled a bell will be struck by hand.
63	Flush deck steamer, two masts, schooner-rigged, red circular wire daymark at each masthead. Hull red, "Cape Elizabeth" in white letters on each side and "74" on each bow and each quarter. Masts white, with black smokestack between.	----------	12-inch steam chime whistle; blasts 3 seconds, silent intervals 27 seconds.
64	Gray granite tower, with white dwelling attached. Pyramidal skeleton bell-tower to SW. of light-tower, and elevated pyramidal oilhouse northwesterly of it.	65¾	Bell struck by machinery every 10 seconds.
65	Two towers painted white, with white bases. A white dwelling connected by a covered way to each tower, and a third white dwelling near easterly tower. Red-brick oilhouse about midway between towers. White fog-signal house on extreme E. point of the cape, about 900 feet from E. tower. Life-saving station near fog-signal house. Life-Saving Service watchhouse 200 feet E. of easterly tower.	55¼	10-inch steam whistle; blasts 5 seconds, alternate silent intervals 20 seconds and 30 seconds.
66		54½	
67	White tower and dwelling, connected by a porch. White fog-signal house near the tower to the eastward and red-brick oilhouse about 100 feet to westward.	69	Second-class Daboll trumpet; blasts 5 seconds, silent intervals 15 seconds. If trumpet be disabled a bell will be struck by hand.
68	Black cylindrical foundation surmounted by a conical brick tower, painted white, with a white watch-room and black lantern. A gallery with roof surrounds the base of the tower.	----------	Bell struck by machinery a double blow every 12 seconds.
69	White tower with white frame dwelling attached, on the outer end of the granite breakwater.	19½	Bell struck by machinery every 15 seconds.
70	White tower and dwelling, connected by a porch. A white pyramidal bell-tower, about 30 feet high, stands to the southward.	48¼	Bell struck by machinery a single and a double blow alternately, intervals 25 seconds.
71	White tower, connected with dwelling by a covered way	25	Hand bell rung in answer to signals.
72	Conical white tower; lantern, black. White dwelling 50 feet N. of tower. Framework for fog signal near tower.	35	Bell struck by machinery every 15 seconds.
73	Conical, gray granite tower and dwelling, with framed, white, upper story, connected by a workroom. White storehouse near base of tower on N. side, and gray stone oilhouse about 150 feet away on same side.	122¼	Bell rung in answer to signals.

TABLE OF LIGHTS.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
		° ′ ″				
74	WHALEBACK	43 03 32 70 41 49	Fixed white varied by a white flash every 90 seconds.	4	59	13
75	Portsmouth Harbor (Newcastle)	43 04 16 70 42 33	Fixed white	4	52	12
76	Range. Seavys Island Front		Fixed white	Post lantern.	15	
77	Range. Seavys Island Rear	43 04 (26) 70 44 (18)	Two fixed red	Post lantern.	{23} {31}	
	LITTLE HARBOR:					
78	Jerrys Point Beacon	43 03 (18) 70 42 (51)	Fixed red	Lens lantern.	22	
79	Frosts Point Beacon	43 03 (19) 70 43 (03)	Two fixed white	Lens lantern.	{30} {22}	
80	ISLES OF SHOALS	42 58 02 70 37 25	Flashing alternately red and white; interval between flashes 15 seconds.	2	82	14¾
81	Range. Salisbury Beach Front	42 49 (22) 70 48 (52)	Fixed red	Post lantern.	22	
82	Range. Salisbury Beach Rear	42 49 (26) 70 48 (57)	Fixed white	Post lantern.	32	
83	Newburyport Harbor	42 48 55 70 49 10	Fixed white	4	50	12½
84	Range. Newburyport Upper Harbor Outer Beacon	42 48 42 70 51 55	Fixed red	Refl'r.	36½	
85	Range. Newburyport Upper Harbor Inner Beacon	42 48 41 70 52 00	Fixed green	Refl'r.	57¾	
86	Range. Ipswich Front		Fixed white	Refl'r.	20	9½
87	Range. Ipswich Rear	42 41 (07) 70 46 (00)	Fixed white varied by a white flash every 90 seconds.	5	42	11¾
88	Annisquam Harbor	42 39 (43) 70 40 (55)	Fixed white	5	44½	12
89	Straitsmouth	42 39 (44) 70 35 (19)	Fixed white	6	45½	11
90	CAPE ANN (N.)	42 38 21 70 34 .31	Fixed white	1	161¾	19
91	CAPE ANN (S.)	42 38 13 70 34 32	Fixed white	1	165½	19

In the foregoing table the names of the lights are printed as follows, viz:

1st. PRIMARY SEACOAST LIGHTS.

2d. SECONDARY SEACOAST LIGHTS.

3d. *Light-vessels.*

4th. Sound, bay, and harbor lights.

The geographical positions of lights which are uncertain by some seconds, not having yet been accurately determined, and those of light-vessels which vary somewhat in position, have the seconds inclosed thus: 30° 45′ (57″). The geographical positions which are given without having the seconds so inclosed are furnished by the United States Coast and Geodetic Survey and have been accurately determined by triangulation.

ST. CROIX RIVER TO CAPE ANN.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
74	Conical, gray granite tower, on a cylindrical gray granite pier rising directly from the ledge. Conical, red, fog-signal tower to northward.	69	Third-class Daboll trumpet; blasts 5 seconds, silent intervals 25 seconds.
75	White tower, with white foundation, near an unfinished fort. Bell on small, square, brown, flat-roofed building attached to light-tower; white dwelling near SW. corner of unfinished fort, 320 feet E. ¾ S. from tower.	42	Bell struck by machinery every 10 seconds.
76	White post		
77	Red post, lanterns hung one vertically above the other		
78	Red wooden post on pier at the end of the breakwater		
79	Lanterns, one vertically above the other, on a black wooden post on the pier at the end of the breakwater.		
80	White tower standing alongside of base of old stone tower, from which a covered way extends nearly to the white dwelling. Red-brick oilhouse near end of covered way on S. side.	46	Hand bell rung in answer to signals.
81	Post	12	
82	Post	12	
83	White, octagonal tower; lantern, black. White dwelling and outbuildings, southerly of tower, within 90 feet of it. White oilhouse 112 feet E. by S. of dwelling. Buildings inclosed by high picket fence.	35	
84	Brown, octagonal, pyramidal tower; lantern, black	30½	
85	Square, pyramidal, red-brick tower; lantern, black	48¾	
86	White, pyramidal, shingled tower; upper half of seaward face black	11	
87	White tower; lantern, black. White dwelling and barn to westward of tower	30	
88	White, cylindrical, brick tower, connected with dwelling by a covered way, 100 feet long; lantern, black.	36	
89	White, cylindrical tower; lantern, black. Plank walk over the rocks to upland toward a white dwelling.	32¼	
90	Two gray stone towers; lanterns, black. Workrooms, stone color; covered walks and northerly dwelling, white; one southerly dwelling, light drab, and one white. Brick fog-signal house near easterly shore of island, and white oilhouse about midway between towers.	112½	10-inch steam whistle; alternate blasts of 8 and 4 seconds; alternate silent intervals of 4 and 44 seconds.
91		112½	

In the column "Characteristic of light," the time interval of flashing lights is given from the beginning of one flash to the beginning of the next following flash.

In the column "Distance visible, in nautical miles," will be found the distances within which the lights can be seen, under ordinary conditions of the atmosphere, the height of the light being measured from mean high water and the eye of the observer taken at an elevation of fifteen feet above sea level.

The fact should be noted that sound signals are not always reliable. The sound may be lost while really approaching it, after being heard; or even when approached until close-to, it may not be heard at all, though properly made. These conditions are the exception, not the rule. They are, however, always possible and render great care necessary.

All bearings are *magnetic*, and in the case of visibility of lights given from seaward.

BEARINGS AND DISTANCES.

The following bearings and distances serve to indicate relative positions of certain aids to navigation. An inspection of the charts will enable the mariner to select from the bearings given the ones which may be used as courses.

West Quoddy Head Lighthouse.—The following are bearings and distances from West Quoddy Head Lighthouse:

	Miles.
SW. Wolf Island Lighthouse, New Brunswick, ENE. ¼ E	12
Lepreau Lighthouse, New Brunswick, ENE. ½ E	25½
Musquash Lighthouse, New Brunswick, ENE. ¾ E	36
Cape Spencer Lighthouse, New Brunswick, E. ¾ N	49½
North Point of Grand Manan Island, SE. by E. ⅝ E	7
Southwest Head Lighthouse, Grand Manan Island, S. by W	13
Machias Seal Island Lighthouses, New Brunswick, SW. ⅝ S	19¾
Mount Desert (Rock) Lighthouse, SW. by W. ⅝ W	72

Libby Island Lighthouse.—The following are bearings and distances from Libby Island Lighthouse:

	Miles.
Southwest Head Lighthouse, Grand Manan Island, ESE. ⅞ E	19¾
Machias Seal Island Lighthouses, New Brunswick, SE. ⅝ E	12
Seal Island Lighthouse, Nova Scotia, SSE	92
Moose Peak Lighthouse, WSW. ⅛ W	9
Mount Desert (Rock) Lighthouse, SW. by W. ⅝ W	49

Petit Manan Lighthouse.—The following are bearings and distances from Petit Manan Lighthouse:

	Miles.
Narraguagus Lighthouse, NNE. ⅞ E	5½
Nash Island Lighthouse, NE. by E. ⅛ E	7¾
Machias Seal Island Lighthouses, New Brunswick, E. ⅝ S	33½
Mount Desert (Rock) Lighthouse, SW. ⅛ S	26½
Great Duck Island Lighthouse, WSW	21¼
Matinicus Rock Lighthouses, WSW	55
Baker Island Lighthouse, W. by S	16¼
Schoodic Island whistling buoy, W. ½ S	8

Mount Desert (Rock) Lighthouse.*—The following are bearings and distances from Mount Desert (Rock) Lighthouse:

	Miles.
Baker Island Lighthouse, N. ⅝ E	16½
Egg Rock Lighthouse, N. by E. ½ E	23
Winter Harbor Lighthouse, NNE	23½
Moose Peak Lighthouse, NE. by E. ¼ E	40
Machias Sea Island Lighthouses, New Brunswick, ENE. ⅝ E	54½
Seal Island Lighthouse, Nova Scotia, SE. ⅝ E	98
Matinicus Rock Lighthouses, W. ¼ S	33¼
Spindle on Roaring Bull, WNW. ⅛ W	21¾
Long Island Head, NNW. ⅝ W	12
Great Duck Island Lighthouse, N. ¾ W	11½

Matinicus Rock Lighthouses.—The following are bearings and distances from Matinicus Rock Lighthouses:

	Miles.
Great Duck Island Lighthouse, ENE	33¾
Machias Seal Island Lighthouses, New Brunswick, E. by N	87
Seal Island Lighthouse, Nova Scotia, SE. by E. ½ E	126
Cape Cod Lighthouse, SW. ¼ S	117½
Cape Ann Lighthouses, SW. by W. ⅝ W	102
Boon Island Lighthouse, WSW. ¾ W	81
Cape Elizabeth Light-vessel, W	55½
Cape Elizabeth Lighthouses, W. ¼ N	60
Halfway Rock Lighthouse, W. ⅝ N	52
Seguin Lighthouse, W. ¾ N	39½
Monhegan Lighthouse, WNW. ⅞ W	20

* For additional bearings and distances, see page 30.

Monhegan Island Lighthouse.—The following are bearings and distances from Monhegan Island Lighthouse:

	Miles.
Marshall Point Lighthouse, NNE. ⅝ E	9½
Tennant Harbor Lighthouse, NE. ¼ N	13
Whitehead Lighthouse, NE. ⅜ E	15¼
Cape Cod Lighthouse, SSW. ⅞ W	108
Boston Light-vessel, SW. ¼ W	106
Cape Ann Lighthouses, SW. ¾ W	87
Isles of Shoals Lighthouse, SW. by W. ¾ W	74
Boon Island Lighthouse, WSW	63
Cape Elizabeth Light-vessel, W. ¾ S	36½
Wood Island Lighthouse, W. ⅝ S	47½
Cape Elizabeth (East) Lighthouse, W. ⅛ S	40
Halfway Rock Lighthouse, W. ⅜ N	31½
Seguin Lighthouse, W. ½ N	19½
Ram Island Lighthouse, NW. by W. ⅝ W	12½
Pemaquid Point Lighthouse, NW. ⅛ W	9¼

Seguin Lighthouse.—The following are bearings and distances from Seguin Lighthouse:

	Miles.
Pond Island Lighthouse, N	2
Hendricks Head Lighthouse, NE. ⅝ N	7½
Ram Island Lighthouse, NE. by E. ⅞ E	9
Cape Cod Lighthouse, S. by W. ⅞ W	100¾
Boston Light-vessel, SW. ¼ S	93
Cape Ann Lighthouses, SW	73
Isles of Shoals Lighthouse, SW. by W	57¾
Boon Island Lighthouse, SW. by W	46¾
Cape Elizabeth Light-vessel, SW. by W. ⅞ W	18
Wood Island Lighthouse, WSW. ½ W	28¾
Cape Elizabeth (East) Lighthouse, W. ¾ S	20¾
Portland Head Lighthouse, W	20
Halfway Rock Lighthouse, W	12⅝

Cape Elizabeth (East) Lighthouse.—The following are bearings and distances from Cape Elizabeth (East) Lighthouse:

	Miles.
Halfway Rock Lighthouse, ENE	8¾
Matinicus Rock Lighthouses, E. ¼ S	60
Cape Cod Lighthouse, S. ⅞ W	91½
Cape Ann Lighthouses, SSW. ¾ W	58
Isles of Shoals Lighthouse, SW. ¼ S	40¼
Boon Island Lighthouse, SW. ½ S	29½
Wood Island Lighthouse, SW. by W	8½

Boon Island Lighthouse.—The following are bearings and distances from Boon Island Lighthouse:

	Miles.
Wood Island Lighthouse, NNE. ⅞ E	21
Halfway Rock Lighthouse, NE	37½
Cape Elizabeth Light-vessel, NE. ½ E	29
Matinicus Rock Lighthouses, ENE. ¾ E	81
Cape Cod Lighthouse, S. ¼ E	67½
Cape Ann Lighthouses, SSW	29
Isles of Shoals Lighthouse, SW. ¼ W	11¼
Cape Neddick Lighthouse, NW. ⅜ W	5½

Isles of Shoals Lighthouse.—The following are bearings and distances from Isles of Shoals Lighthouse:

	Miles.
Cape Neddick Lighthouse, N. by E. ⅞ E	12
Wood Island Lighthouse, NE. ⅝ N	32
Halfway Rock Lighthouse, NE. ⅛ E	48½
Matinicus Rock Lighthouses, ENE. ½ E	90½

Isles of Shoals Lighthouse—Continued.

	Miles.
Cape Cod Lighthouse, S. by E	61
Cape Ann Lighthouses, S. ⅝ W	20
Annisquam Lighthouse, S. by W. ⅞ W	18½
Ipswich Rear Lighthouse, SW. by S	18
Newburyport Harbor Lighthouse, SW. by W	12½
Portsmouth Harbor (Newcastle) Lighthouse, N. by W. ½ W	7½

Cape Ann Lighthouses.—The following are bearings and distances from Cape Ann Lighthouses:

	Miles.
Portsmouth Harbor (Newcastle) Lighthouse, N. ½ E	26½
Cape Neddick Lighthouse, N. by E. ½ E	31½
Wood Island Lighthouse, NNE. ⅝ E	50½
Halfway Rock Lighthouse, NE. ⅞ N	65½
Cape Elizabeth Light-vessel, NE. ¾ N	57
Matinicus Rock Lighthouses, NE. by E. ⅝ E	102
Cape Cod Lighthouse, S. by E. ¾ E	42½
Minots Ledge Lighthouse, SW. by S	23½
Boston Light-vessel, SW. ⅝ S	19½

STORM WARNING DISPLAY STATIONS.

The storm warning displays of the United States Weather Bureau are made for the benefit of mariners at the following stations. The signals are described and their meaning is explained in Appendix III.

Eastport, Me.*
West Quoddy Head, Me.
Machiasport, Me.
Bangor, Me.
Whitehead, Me.
Marshall Point Light, Me.
Boothbay Harbor, Me.
Portland, Me.*
Isles of Shoals, Me.
Portsmouth, N. H.
Jaffray (Jerrys) Point Life-saving Station, N. H.
Wallis Sands Life-saving Station, N. H.
Rye Beach Life-saving Station, N. H.
Newburyport, Mass.
Gloucester, Mass.

UNITED STATES LIFE-SAVING STATIONS.

The following list of life-saving stations has been corrected to July 1, 1902. The geographical positions given are approximate and are taken from the Official Register of the service. These stations are furnished with lifeboats, mortars, and all other appliances for affording assistance in cases of shipwreck.†

Name of Station.	State.	Locality.	Approximate Position. Latitude, north.	Longitude, west.
			° ′ ″	° ′ ″
Quoddy Head	Me	In Carrying Place Cove, 1¼ miles W. from West Quoddy Head Lighthouse.	44 48 40	66 58 50
Cross Island	Me	On eastern end of island at entrance to Machias Bay	44 36 45	67 16 30
Crumple Island	Me	On north side of island, 3½ miles W. by S. from Moose Peak Lighthouse.	44 26 40	67 36 10
Cranberry Islands	Me	On SE. end of Little Cranberry Island about 1 mile N. by W. ¾ W. from Baker Island Lighthouse.	44 15 30	68 12 40
Whitehead	Me	About ⅝ mile W. from Whitehead Lighthouse.	43 58 40	69 08 00
Burnt Island	Me	On north side of island, 6½ miles NNE. from Monhegan Island Lighthouse.	43 52 20	69 17 40
Damiscove Island	Me	On the west shore of Damiscove Harbor	43 45 20	69 37 00
Hunniwells Beach	Me	On the west side Kennebec River Entrance, ¾ mile NNW. from Pond Island Lighthouse.	43 45 00	69 46 55
Cape Elizabeth	Me	A little over ½ mile S. from Cape Elizabeth East light	43 33 58	70 12 00
Fletchers Neck	Me	About 1 mile SW. from Wood Island Lighthouse	43 26 30	70 20 30
Jaffray (Jerrys) Point.	N. H	On west side Portsmouth Harbor Entrance, ¾ mile W. from Whaleback Lighthouse.	43 03 30	70 42 45
Wallis Sands	N. H	2¾ miles SW. ¼ W. from Whaleback Lighthouse	43 01 15	70 44 00
Rye Beach	N. H	4⅞ miles SW. from Whaleback Lighthouse	42 59 30	70 45 20
Hampton Beach	N. H	8½ miles SW. from Whaleback Lighthouse	42 56 20	70 47 40
Salisbury Beach	Mass	2¾ miles north from Newburyport Harbor Lighthouse	42 51 40	70 49 00
Newburyport	Mass	½ mile SE. from Newburyport Harbor Lighthouse	42 48 30	70 49 00
Plum Island	Mass	5 miles S. from Newburyport Harbor Lighthouse	42 44 00	70 47 15
Straitsmouth	Mass	½ mile W. from Straitsmouth Lighthouse	42 39 30	70 36 00

* At these stations barometers will be compared with standards.

† Instructions to enable mariners to avail themselves fully of the assistance thus afforded will be sent free of charge upon application to the General Superintendent of the Life-Saving Service, Washington, D. C.

MASSACHUSETTS HUMANE SOCIETY LIFE-SAVING STATIONS.

Stations.	Life-Saving apparatus.
Annisquam	Lifeboat.
Rockport	Lifeboat and dory. Hunt gun and apparatus.
Emersons Point, Cape Ann	Lifeboat.

TIDES.*

GENERAL TABLE.

Locality.	Lunitidal Intervals.†				Correction for standard time.	Rise and Fall (Range).			Rise of highest tide observed.
	High water.		Low water.			Mean tides.	Spring tides.	Neap tides.	
	h.	m.	h.	m.	m.	Feet.	Feet.	Feet.	Feet.
Eastport, Me	11	09	5	05	−32	18.2	20.9	15.2	25.3
Little River, Cutler	10	43	4	38	−31	14.1	16.2	11.9	19.7
Machias Bay, Starboard Island	10	44	4	40	−30	12.5	14.4	10.5	18.0
Machias Bay, Machiasport	11	02	4	59	−30	13.5	15.5	11.3	18.9
Moose Peak Lighthouse	11	33	4	24	−30	12.0	13.8	10.0	16.8
Moosabec Reach, Jonesport	10	58	4	49	−30	11.7	13.5	9.8	16.3
Nash Island Lighthouse	10	40	4	30	−29	11.0	12.6	9.2	16.3
Narraguagus Bay, Trafton Island	10	43	4	23	−29	11.2	12.9	9.4	16.6
Narraguagus Bay, Millbridge	10	54	4	44	−28	11.3	13.0	9.5	16.7
Prospect Harbor	10	50	4	39	−28	10.8	12.4	9.1	16.0
Frenchman Bay, Winter Harbor	10	52	4	41	−28	10.8	12.4	9.1	16.0
Frenchman Bay, Bar Harbor	10	54	4	43	−27	11.1	12.8	9.3	16.5
Frenchman Bay, Sullivan Harbor	11	09	4	59	−27	11.5	13.2	9.7	17.0
Burnt Coat Harbor	11	05	4	55	−26	10.0	11.5	8.5	15.5
Blue Hill Bay, Bass Harbor	10	53	4	42	−27	10.0	11.5	8.4	14.8
Blue Hill Bay, Union River	11	11	5	01	−26	11.5	13.2	9.7	17.0
Blue Hill Bay, Blue Hill Harbor	11	07	4	57	−26	10.9	12.5	9.2	16.1
Eggemoggin Reach, Naskeag Harbor	11	00	4	46	−26	10.0	11.5	8.4	15.4
Deer Island Thorofare, Stonington	10	59	4	45	−25	9.6	11.0	8.1	14.1
Fox Islands Thorofare, Iron Point	11	08	4	54	−25	10.0	11.5	8.4	14.8
Penobscot Bay, Carvers Harbor	10	55	4	41	−25	9.3	10.7	7.8	13.8
Penobscot Bay, Muscle Ridge Channel	11	05	4	51	−24	9.4	10.8	7.9	14.9
Penobscot Bay, Rockland Harbor	11	09	4	55	−24	9.5	11.0	8.1	14.1
Penobscot Bay, Castine Harbor	11	25	5	12	−25	9.8	11.3	8.2	14.5
Penobscot Bay, Belfast Harbor	11	35	5	22	−24	10.2	11.7	8.6	15.1
Penobscot River, Fort Point	11	34	5	21	−25	10.1	11.6	8.5	14.9
Penobscot River, Bangor	12	48	6	47	−25	13.1	15.1	11.0	17.9
Port Clyde	10	56	4	42	−23	9.4	10.8	7.9	13.9
Damariscotta River Entrance	11	00	4	45	−22	9.0	10.4	7.6	13.4
Boothbay Harbor	10	59	4	44	−21	9.4	10.8	7.9	13.9
Sheepscot River Entrance	10	59	4	44	−21	9.5	10.9	8.0	14.0
Sheepscot River, Wiscasset	11	23	5	09	−21	9.8	11.2	8.2	14.5
Kennebec River Entrance	11	24	5	01	−21	8.3	9.5	7.0	12.4
Bath	12	13	6	16	−21	6.9	7.9	5.8	10.7
New Meadows River, Fosters Point	11	33	5	22	−20	8.9	10.2	7.5	13.3
Casco Bay, Harpswell Harbor	10	55	4	36	−20	8.9	10.2	7.5	13.3
Portland Harbor	11	06	4	51	−19	8.8	10.1	7.3	13.1
Richmonds Island	11	00	4	45	−19	8.6	9.9	7.2	12.9
Saco River Entrance	11	07	4	52	−18	8.9	10.2	7.5	13.4
Portsmouth Harbor	11	23	5	09	−17	9.2	10.5	7.7	13.6
Newburyport Harbor	11	23	5	10	−17	7.9	9.1	6.6	11.8
Ipswich Entrance	11	17	5	04	−17	8.8	10.1	7.4	12.9
Annisquam	11	13	5	00	−17	8.8	10.1	7.4	12.9
Rockport Harbor	10	57	4	43	−18	8.6	9.9	7.2	12.8

*Tide tables for the Atlantic coast of the United States, published annually by the United States Coast and Geodetic Survey, predicting the times and heights of tides for every day of the year, at all the principal ports, can be obtained from the agents named in the list given on pages 7–8; price $0.15.

†The mean lunitidal interval for high water or for low water is the average time from the meridian transit of the moon to the next following high or low water, respectively; it is also called the corrected establishment.

VARIATION OF THE COMPASS.

The magnetic variations for 1903, and annual increase at points mentioned, are as follows:

Locality.	Variation.	Annual increase.
	°	′
Eastport	19	0
Little River	18½	0
Machias Bay	18¼	½
Jonesport	18	½
Off Petit Manan	17¾	1
Frenchman Bay Entrance	17½	1
Off Mount Desert Rock	17¼	1
Blue Hill Bay Entrance	17	1
Deer Island Thorofare	16¾	1
Off Matinicus Rock	16½	1
Penobscot Bay, East of Rockland	16¼	1
Off Monhegan	15¾	1½
Muscongus Bay Entrance	15½	1½
Boothbay Entrance	15¼	1½
Off Seguin, Kennebec Entrance	15¼	1½
Off Cape Elizabeth	14¾	1½
Off Cape Porpoise	14	1½
Off Isles of Shoals	13½	1½
Newburyport Harbor Entrance	13¼	1½
Off Cape Ann	13½	1½

GENERAL REMARKS ON APPROACHING OR STANDING ALONG THE COAST OF MAINE.

Tidal Currents.—The tidal currents on the Coast of Maine and in the bays and rivers have considerable velocity; they must always be considered and allowed for. In thick weather or light winds vessels are sometimes set ashore by them.

Alongshore the flood sets eastward and has greater velocity than the ebb, which sets westward. In passing from one headland to another it is always necessary to make allowance for the current setting into or out of the bays or rivers, according to the stage of the tide; such allowance frequently amounts to as much as ½ point.

In the Bay of Fundy the currents are particularly strong. Eastward of Mount Desert the currents have a greater velocity than farther west, but are more regular in their ebb and flow, conforming more exactly to the rise and fall of the tides. Along the coast between Mount Desert and Portland the effect of the westerly (ebb) set is more marked as compared with the flood than is the case farther east.

With easterly or southeasterly winds the currents have more of a tendency on shore than at other times, but they are not affected much by northerly, westerly, or southerly winds.

No systematic current observations have been made along the Coast of Maine. (For offshore current data see Appendix I.)

Fogs are the dread of the navigator on this coast in summer; they are liable to set in at any time, often with almost no warning. They are of frequent occurrence during June, July, and August, and the months of May and September are not free from them; some portion of this period invariably has much thick weather, while other portions may be free from it. Fogs have been known to last three weeks, almost without intermission. At the heads of the bays and within the rivers it is often comparatively clear when thick outside; the fog of such interior waters usually "scales up" (clears) throughout the middle of the day. Winds from east to southwest, by the way of south, are those which bring in fog; westerly and northerly winds clear it away.

Under this heading scarcely any rule can be made that is not subject to frequent exceptions, and those who have the most experience in the matter are the least apt to make predictions. It is usually the case, however, that a fall of the barometer below 30 inches during a fog will be followed by the lifting of the fog. If a wisp of mist is to be seen hanging over Mount Desert or over the Camden Hills, whether otherwise clear or not, the following day

is usually foggy. When calm during the ebb tide, if the fog is seen in a bank offshore, provided it remains calm, the fog will come in with the following flood.

During thick weather great caution is necessary when approaching the coast, especially eastward of Petit Manan, where the tidal currents have considerable velocity. If one of the offshore lighthouses has not been made and the position accurately determined before the fog shuts in, it is advisable to keep well outside until it clears. East of Seguin Island, except southward and eastward of Grand Manan Island, in clear weather the land will always be made before any of the outlying dangers are encountered, and by keeping 3 miles outside of the headlands and outlying islands, vessels will clear all unmarked dangers.

Coming from the vicinity of Cape Sable.—Vessels bound to Machias or ports eastward of it, should make Machias Seal Island Lighthouses and pass westward of them. If bound to Eastport or Calais, when 2½ miles northward of these lights haul eastward and stand in through the Grand Manan Channel, passing North Shoal and North Rock at a safe distance. This route is preferable to passing eastward of Grand Manan, as in case of bad weather coming on an anchorage may be made either at Little River or in Machias Bay. Southward and eastward of Grand Manan there are numerous ledges and dangers, also strong tidal currents.

It is not advisable for a stranger to past eastward of the Machias Seal Islands or between them and Grand Manan, where there are a number of ledges on which the sea breaks in heavy weather, including Bull Rock, an unmarked danger with 2 feet of water over it.

If bound to ports in Penobscot Bay, vessels should steer so as to make either Mount Desert Lighthouse or Matinicus Rock Lighthouses. In the former case, on a clear day, Green Mountain, the highest part of Mount Desert Island, may be sighted before the lighthouse, when the course should be changed so as to bring the mountain to bear about **N. ½ E.**, distant about 23 miles. This will lead very near Mount Desert Rock, from which point a new departure should be taken. When steering for Matinicus Rock Lighthouses, Isle au Haut, 556 feet high, on a clear day may be sighted about the same time as the rock.

Coming from the vicinity of Cape Cod or Cape Ann.—Vessels bound into Penobscot Bay or ports eastward either steer to make Monhegan Lighthouse or Matinicus Rock Lighthouses. In the winter the smaller class of vessels and coasters should follow the coast, sighting the principal lighthouses and making an anchorage on the approach of bad weather. East of Monhegan they should use the inland passage if it is free from ice.

On all the banks in or near the Gulf of Maine a number of fishing vessels may be found at anchor. They are sometimes very numerous in the South Channel, on the Georges Bank and Jeffrey Ledge. In the summer a large fleet of mackerel fishermen will often be met near the coast between Mount Desert Rock and Cape Ann.

Standing along the Coast.—In clear weather vessels stand along the coast close enough to make the lighthouses and to recognize the principal landmarks on shore. In thick weather they aim to make the fog signals or the whistling or bell buoys; these buoys are placed close enough to one another and to the fog signals to be readily followed up by vessels if not set too much off their course by the tidal currents. When running in thick weather a vessel should verify her position as often as possible by the aids, and when approaching a fog signal or buoy should proceed slowly, using the lead, and if necessary stop until the looked-for aid is found and recognized, before she continue for the next aid. There are three good harbors for which a stranger standing along the coast in their vicinity can make in thick weather and enter with ordinary precaution—Machias Bay, Winter Harbor, and Boothbay Harbor.

Inside Passages and Thorofares.—The numerous islands along the stretch of coast from Mount Desert Island to Portland, Me., make it possible for vessels of limited draft to avoid a heavy sea and find convenient anchorages, for a great part of this distance, by using the thorofares and passages inside and among the islands. The principal and most frequented route is from Southwest Harbor across Cranberry Island Bar, Bass Harbor Bar, and Blue Hill Bay, through Casco Passage or York Narrows, across Jericho Bay,

through Deer Island Thorofare or Merchants Row, across East Penobscot Bay, through Fox Islands Thorofare, across West Penobscot Bay, and through Fisherman Island Passage and Muscle Ridge Channel. This is practically a continuous inside passage, good for a draft of 9 feet at low water and 17 feet at ordinary high water. A continuation westward is through Davis Straits, through Fisherman Island Passage, and among the islands in the western part of Casco Bay.

SAILING DIRECTIONS, COAST OF MAINE, OFFSHORE.

From West Quoddy Head to Mount Desert Rock and from thence to points southward and westward.—With West Quoddy Head bearing *N.*, distant 1 mile, make good the course **SW.** by **W.** ⅝ **W.** for 71½ miles; Mount Desert (Rock) Lighthouse should then bear *N.*, distant about 1½ miles. From this position the courses and distances are to:

	Miles.
1½ miles **S.** of Matinicus Rock Lighthouses, **W.** ¼ **S**	33¼
1 mile **S.** of Boon Island Ledge whistling buoy, **W.** by **S**	111
1 mile **S.** of Isle of Shoals Lighthouse, **WSW.** ⅞ **W**	124½
1½ miles **SE.** of Cape Ann Lighthouses, **WSW.** ⅛ **W**	132
Whistling buoy off the Graves, **WSW**	152½
Boston Light-vessel, **SW.** by **W.** ⅞ **W**	150
1 mile **NW.** of Race Point Lighthouse, **SW.** ⅞ **W**	146½
1½ miles eastward of Cape Cod Lighthouse, **SW.** ⅝ **W**	140½

Remarks.—The **SW.** by **W.** ⅝ **W.** course from West Quoddy Head to Mount Desert Rock leads along the coast until abreast Little River whistling buoy, which is left about ¼ mile on the starboard hand, but in no case does the sailing line approach closer than 1 mile to the land. After passing Little River the sailing line gradually draws offshore, passing about 3¾ miles south of Libby Island, and nearly 5 miles south of Moose Peak Lighthouse, leaving Moose Peak whistling buoy about 2¼ miles on the starboard hand. After passing the latter lighthouse, the coast will become indistinct and only the higher hills and Mount Desert Island can be distinguished until Mount Desert Rock is made.

At night the revolving light on Southwest Wolf Island will be seen on the port quarter until up to Moose Cove; Machias Seal Islands Lights will then be made broad off the port bow and Little River Light be opened on the starboard bow when it is distant about 5 miles. When about 3 miles distant from Little River Light, Libby Island Light will be made well on the starboard bow, and when abreast Cross Island, Moose Peak Light will be made on the starboard bow. When Moose Peak Light bears **N.**, distant about 5 miles, Petit Manan Light will be made broad off the starboard bow; the sailing line passes about 10 miles southward of it. Nash Island Light may be seen to the northward on a clear night.

When Petit Manan Light bears about **NNE.** Mount Desert (Rock) Light should be made about ¾ point on the starboard bow, and about the same time Baker Island Light may be seen on a clear night bearing about **NW.**

SAILING DIRECTIONS, COAST OF MAINE, ALONGSHORE.

1. ***From West Quoddy Head to the Whistling Buoy off Moose Peak Lighthouse.***—When close to Sail Rock whistling buoy, with West Quoddy Head bearing *NW.* by *N.* distant nearly ¾ mile, steer **SW.** by **W.** ⅝ **W.** about 14 miles; Little River Lighthouse will then bear *NW.* by *W.* distant 1 mile, and Little River whistling buoy should be close aboard. From this position steer **WSW.** ⅛ **W.** about 18½ miles until up to the whistling buoy, 2 miles *SSE.* from Moose Peak Lighthouse. From this position follow the directions in sections 2, 2 A, 2 B, or 2 C, according to destination.

Remarks and dangers.—All dangers are avoided by giving the coast and outlying islands a berth of ¼ mile.

On the **SW.** by **W.** ⅝ **W.** course the coast is nowhere approached nearer than ½ mile, and this will be when the vessel is about 1½ miles eastward of Little River whistling buoy. Little River Lighthouse will be made on the starboard bow when it is distant about 5 miles.

On the **WSW.** ⅛ **W.** course Old Man and Double Shot Islands will be left ⅝ mile on the starboard hand; these islands should not be approached closer than ¼ mile. The sailing line passes nearly 2 miles south of Libby Island and a little over 2¼ miles south of Black Head; it passes near Southeast Ledge, which lies 3¼ miles

E. by S. from Moose Peak Lighthouse, has a least depth of 7½ fathoms over it, and is marked by tide rips and in heavy weather by breakers.

At night Libby Island Light will be made on the starboard bow just after Little River Light is shut out by Little River Head. If Libby Islands Light has been made and kept in sight, on the SW. by W. ⅝ W. course, before Little River Light bears abeam, it indicates that the vessel's position is south of the sailing line. When abreast of Cross Island, Moose Peak Light should be made on the starboard bow. When up to the whistling buoy off Moose Peak Light, Petit Manan Light will be made on the starboard bow.

2. ***From the Whistling Buoy off Moose Peak Lighthouse to the Eastern Approach to Southwest Harbor.***—From the whistling buoy steer **W. ¼ S.** about 16¼ miles so as to leave the whistling buoy off Petit Manan about 300 yards on the starboard beam. From the latter steer **W. ⅝ N.** about 16¼ miles, passing close southward of the whistling buoy off Schoodic Island, and a little over ¼ mile north of the beacon on East Bunkers Ledge.

Or, if desiring to enter south of East Bunkers Ledge, from Petit Manan whistling buoy make good a **W. ⅛ N.** course for 16¼ miles, passing ¼ mile south of Schoodic whistling buoy, and the same distance south of East Bunkers Ledge Beacon; then proceed as directed under the heading "Southwest Harbor."

Remarks and dangers.—The W. ¼ S. course leads 1¼ miles southward of the islands and ledges which extend about 5 miles westward from Moose Peak Lighthouse, and a little over ¾ mile southward of Tibbett Rock. **Jackson Ledge,** 3¾ fathoms of water, will be left about ⅝ mile on the starboard hand. The entrances to Moosabec Reach, and Pleasant, Narraguagus, and Pigeon Hill bays are left on the starboard hand between Egg Rock and Petit Manan Island. When nearly up to Petit Manan whistling buoy, Simms Rock buoy will be left nearly ¾ mile on the port hand. **At night** Petit Manan Light will be on the starboard bow. When Nash Island Light bears NE. ¾ N. Tibbett Rock will be passed and Jackson Ledge should be just forward of the starboard beam; the whistling buoy should then be 2¾ miles distant ahead. To insure clearing Jackson Ledge, Petit Manan Light should bear a little northward of WNW. ¼ W. when Narraguagus Light is just clear of Jordans Delight and bears N.

Sea Horse Rock is the westernmost of the ledges which extend in a broken line about 5 miles westward from Moose Peak Lighthouse. It is small, bare at half tide, and lies about ⅝ mile WSW. ¼ W. from Egg Rock.

Tibbett Rock, a small rock with 12 feet over it, lies 3¼ miles E. from Petit Manan Lighthouse and 5 miles SW. ¾ S. from Nash Island Lighthouse. The rock is not marked except by breakers when there is a heavy swell.

Jackson Ledge is nearly ¼ mile in diameter, and has a least depth of 3¾ fathoms; it lies 2¼ miles ESE. ¾ E. from Petit Manan Lighthouse, and should be left on the starboard hand when approaching Petit Manan from off Moose Peak Lighthouse.

Southeast Rock has 5 feet of water over it and is surrounded by deep water. It lies 3¼ miles SSE. ¼ E. from Petit Manan Lighthouse, and is marked by a buoy (can, red and black horizontal stripes).

Simms Rock, a detached rock with 6 feet over it, lies 1¾ miles S. from Petit Manan Lighthouse and 1⅞ miles NW. by W. from Southeast Rock. It is marked by a buoy (nun, red and black horizontal stripes), which should be given a berth of at least ¼ mile.

Petit Manan Reef makes off nearly ¼ mile southward from Petit Manan Island. It is marked by a buoy (nun, red, No. 2), which is placed off its southern end, and should not be approached from southward closer than 200 yards.

On the W. ⅝ N. course Schoodic Island will be on the starboard bow, and left nearly ¼ mile on the starboard hand. Schoodic whistling buoy should be made ahead. The entrance to Dyers and Gouldsborough bays and Prospect Harbor are left on the starboard hand between Petit Manan and Schoodic Island. After passing the whistling buoy off Schoodic Island, Frenchman Bay will be opened northward, and while crossing the entrance of this bay the beacon on East Bunkers Ledge should be made a little on the port bow, and the eastern approach to Southwest Harbor will be ahead. **At night** Baker Island Light should be made after passing Petit Manan, and Petit Manan Light should be kept bearing northward of E. ¼ N. until Egg Rock Light is made and bears NW., or until up to the whistling buoy off Schoodic Island. When approaching East Bunkers Ledge, and Baker Island Light bears SW., Bear Island Light should be made a little on the starboard bow.

Moulton Ledge, showing partly bare at low water, is about 350 yards in diameter, and is marked by a buoy (spar, red and black horizontal stripes) placed westward of it. This ledge lies 3 miles WNW. ¾ W. from Petit Manan Lighthouse. About ⅝ mile S. from Moulton Ledge and 3 miles W. ¼ N. from Petit Manan Lighthouse is an unmarked spot with 18 feet over it.

A ledge makes out about 400 yards southward from Schoodic Island. Vessels should keep southward of the whistling buoy.

Otter Cliff Ledge, bare at half tide, lies ¼ mile ESE. from Otter Cliff and 3⅝ miles SW. ¾ W. from Egg Rock Lighthouse; it is marked by a black bell buoy placed ⅛ mile SE. from the ledge.

2 A. ***From the Whistling Buoy off Moose Peak Lighthouse to Bass Harbor Bar.***—Follow the directions in section 2, and when Petit Manan whistling buoy is 300 yards distant on the starboard beam, steer **W. ⅞ S.** for 15⅝ miles until up to the whistling buoy, which is 1⅛ miles *SSE.* ¼ *E.* from Baker Island Lighthouse; then steer **WNW. ⅞ W.** for 6¾ miles, crossing Bass Harbor Bar about 300 yards south of the lighthouse (see section 1, "Sailing Directions, Bass Harbor.")

At night.—Follow the directions in section 2 B, following, until Petit Manan Light bears *N.*, distant about 4 miles; then steer **W. ⅛ N.** about 15½ miles to the whistling buoy off Baker Island; the course is then **WNW. ⅞ W.**, with Bass Harbor Head Light a little on the starboard bow, and the sailing directions for Bass Harbor, section 1, should be followed.

Remarks.—See the remarks for the **W. ¼ S.** course in section 2, preceding. On the **W. ⅞ S.** course Baker Island will be made on the starboard bow, and on drawing near the island the whistling buoy will be made ahead. On the port bow Little Duck and Great Duck islands will be the nearest land. From the whistling buoy, see directions, remarks, and dangers in section 1, "Sailing Directions, Bass Harbor."

At night it is advisable to pass outside the dangers lying southward of Petit Manan. The **WSW. ¾ W.** course from the whistling buoy off Moose Peak Lighthouse leads southward of all dangers and about 4 miles south of Petit Manan Lighthouse.

On the **W. ⅛ N.** course Baker Island Light will be made on the starboard bow, and the lights described in the remarks under section 2 will be made to the northward in the order named.

For the dangers between the whistling buoy off Moose Peak Lighthouse and Baker Island, see "Dangers," in section 2.

2 B. ***From the Whistling Buoy off Moose Peak Lighthouse to Great Duck Island Lighthouse.***—From the whistling buoy steer **WSW. ¾ W.** about 37 miles; Great Duck Island Lighthouse will then bear *NNW.*, distant about 1 mile. Then follow the directions in sections 3 or 3 A.

Remarks.—Having stood about 14½ miles on the **WSW. ¾ W.** course, Southeast Rock buoy should be in range with Petit Manan Lighthouse, bearing about **NNW. ⅛ W.** The buoy should be left about ⅛ mile on the starboard hand, and when about 12 miles westward of it the Duck Islands should be made on the starboard bow.

The sailing line passes 1 mile south of Great Duck Island Lighthouse, and if continued leads the same distance south of **Long Island Head.** This head is about 80 feet high and well wooded; it is the southeastern part of Long Island, a thickly wooded island about 1½ miles in diameter and 205 feet high at its highest point.

At night Narraguagus Light should be made to the northwestward when passing Crumple Island, and Nash Island Light will be opened when well past the ledges lying westward of Crumple Island. After passing Petit Mahan Light, Prospect Harbor Light will be opened to the northwestward, and Baker Island Light will be made broad off the starboard bow; farther on Winter Harbor Light will be opened from behind Schoodic Head, and Egg Rock Light may be seen westward of it. When Baker Island Light is abeam, Mount Desert (Rock) Light will be in sight forward of the port beam. The southern end of Great Duck Island should not be approached closer than ¼ mile.

Dangers.—**Southeast Rock** and **Simms Rock** are described on page 31.

Ledges make out nearly ¼ mile southward from the south end of Great Duck Island. These show partly bare at low water, and are avoided by giving the southern end of the island a berth of over ¼ mile.

2 C. ***From the Whistling buoy off Moose Peak Lighthouse to a position 1 mile south of Matinicus Rock.***—From the whistling buoy steer **WSW. ½ W.** This course made good for 71 miles leads 5 miles south of Petit Manan Lighthouse, 3 miles south of Great Duck Island Lighthouse and Long Island Head, 3 miles south of Seal Island, 1 mile south of Matinicus Rock, and 1 mile north of the whistling buoy. For bearings and distances from Matinicus Rock Lighthouses see page 24.

Remarks.—The **WSW. ½ W.** course leads well southward of all dangers. Southeast Rock, the nearest, will be left about 1¼ miles on the starboard hand when Petit Manan Lighthouse bears about **NNW. ⅛ W.** In clear weather Mount Desert (Rock) Lighthouse will be seen about 8 miles to the southward when nearly abreast Great Duck Island, and Green Mountain, on Mount Desert Island, will be in sight during the entire run. The whistling buoy 2 miles **S.** of Matinicus Rock will be made a little on the port bow.

At night Nash Island and Narraguagus lights will be seen to the northward; Petit Manan Light will be broad off the starboard bow. After passing the latter, Baker Island Light will be made broad off the starboard

bow, and Prospect Harbor Light and Winter Harbor Light will be made to the northward; on a clear night Egg Rock Light may be seen westward of Winter Harbor Light; Great Duck Island Light will be made on the starboard bow and Mount Desert (Rock) Light will be made broad off the port bow about the time that Winter Harbor Light bears **N.** About the time that Mount Desert (Rock) Light is dropped, Saddleback Ledge Light will be made, bearing about **NW.** by **W.** ¼ **W.**; when the latter bears about **NW.** by **N.** Matinicus Rock Lights should be made on the starboard bow.

3. ***From Great Duck Island Lighthouse to Monhegan Island through Two Bush Channel.***—When Great Duck Island Lighthouse bears *NNW.* distant about 1 mile steer **W.** by **S.** for 19 miles; Roaring Bull Spindle should then bear *N.* distant nearly 1 mile. Then steer **W.** ¾ **N.** about 10¼ miles; Hurricane Island will then bear *N.* distant 5 miles, and Bay Ledge buoy will be about ¾ mile distant on the starboard beam. Then steer **WNW.** ¼ **W.** for 7½ miles, and when Two Bush Island Lighthouse is 1¾ miles distant ahead steer **W.** for 4½ miles, until Whitehead Lighthouse bears *NNE.* distant 2¼ miles and Tennant Harbor Lighthouse bears *NW.* ¼ *W.* Then steer **SW.** by **W.** ¼ **W.** nearly 13 miles; Monhegan Lighthouse should then bear *SSE.* distant 1½ miles and the whistling buoy will be a little over ¼ mile distant on the port beam. Then follow the directions in section 4.

Caution.—The flood sets northward and the ebb southward at the entrance to Penobscot Bay, and when crossing the entrance the navigator must make some allowance for the set of the tidal currents.

Remarks and dangers.—On the **W.** by **S.** course Long Island Head, 4½ miles westward of Great Duck Island, should be left ⅝ mile on the starboard hand. After passing Long Island Head, **Isle au Haut,** a large, high, wooded island, will be on the starboard bow. The course leads ⅝ mile south of the red nun buoy on Eastern Ear Ledge, and for the whistling buoy off Roaring Bull. **Eastern Head** is the southeastern, and **Western Head** the southwestern, point of Isle au Haut. **At night** when nearly midway between Long Island Head and Isle au Haut, Burnt Coat Harbor Lighthouse will be opened between the islands northeastward. When Eastern Head bears about **N.,** Saddleback Ledge Lighthouse will be opened broad off the starboard bow from behind Western Head and Western Ear; the lighthouses on Matinicus Rock may be made broad on the port bow shortly after.

Cold Ledge, a small ledge with 7 feet over it, is about 2⅛ miles **E.** ⅛ **S.** from Eastern Head.

Eastern Ear Ledge, bare at low water, lies about ½ mile **S.** by **E.** ½ **E.** from the eastern end of Eastern Ear; it is about 600 yards long **NNE.** and **SSW.,** and is marked on its south side by a buoy (nun, red, No. 2); the sea breaks on it at all times.

Roaring Bull Ledge, bare at half tide and marked by a spindle (iron, red), lies about 1¼ miles **SW.** ½ **W.** from Eastern Head and about 1⅛ miles **SE.** from Western Ear. Strangers should keep well southward of it.

On the **W.** ¾ **N.** course Saddleback Ledge Lighthouse, and the small islands and ledges westward of it, will be left about 2½ miles on the starboard hand. Heron Neck Lighthouse will be seen on the western side of the entrance to Carvers Harbor (Vinalhaven), and as it approaches a **N.** bearing Bay Ledge buoy should be looked for broad off the starboard bow. **Hurricane Island** is the high bare island just westward of Heron Neck Lighthouse, and forms a prominent mark on the eastern side of the entrance to West Penobscot Bay. **At night** a bow and beam bearing should be taken on Saddleback Ledge Light, which should be 2¼ to 2¾ miles distant when abeam.

Cape Ann Ledge and Western Ear Ledge are described under section 1, "Sailing Directions, East Penobscot Bay."

Snipperahan is a small rocky spot with 6 fathoms over it lying 4¼ miles **SW.** ½ **S.** from Saddleback Ledge Lighthouse and about ¾ mile southward of the sailing line.

Bay Ledge, a small ledge bare at low water, lies 3½ miles **S.** by **W.** ½ **W.** from Heron Neck Lighthouse, and 6½ miles **W.** ⅞ **S.** from Saddleback Ledge Lighthouse; it is marked by a buoy (nun, red, No. 2), which should be given a berth of ¼ mile.

On the **WNW.** ¼ **W.** course Two Bush Island Lighthouse should be made ahead, and when it is about 2 miles distant Northern Triangles buoy (can, black, No. 1) will be about 1 mile distant on the port beam. At night, when Heron Neck Light bears **N.,** if Two Bush Island Light is brought to bear **WNW.** ¼ **W.** and is steered for on this bearing it will give Bay Ledge a good berth.

Northern Triangles is a group of detached ledges 1⅛ miles long in an **ESE.** and **WNW.** direction; they lie about 1⅛ miles northward of Little Green Island, on the south side of Two Bush Channel. There is a buoy (can, black, No. 1) northward of these ledges; it bears **NNE.** ⅜ **E.** distant 1⅝ miles from the western end of Little Green Island.

A spot with 5¼ fathoms over it lies a little over ½ mile **N.** from Northern Triangles buoy, and another spot with 5¾ fathoms over it lies 1¼ miles **S.** ¾ **E.** from Two Bush Island Lighthouse. The sea breaks on these spots in heavy gales.

On the **W.** course the northern end of Mosquito Island will be ahead, and Whitehead and Tennant Harbor lighthouses will be made on the starboard bow. The sailing line leads about ½ mile northward of the 5¾-fathom spot lying 1¼ miles **S. ¾ E.** from Two Bush Island Lighthouse, and about the same distance southward of Two Bush Island Lighthouse and Crow Island Ledges buoy.

Alden Rock, a detached rock with 4 feet of water over it, lies about 2¾ miles **ENE. ½ E.** from the northern end of Metinic Island; it is marked by a buoy (spar, red and black horizontal stripes) placed southward of it.

Crow Island Ledges extend 1¼ miles westward of Two Bush Island and consist of a number of rocks with 8 to 15 feet over them. A buoy (spar, red, No. 2) marks their western end, and it should be left well on the starboard hand by vessels coming from eastward.

On the **SW.** by **W. ¼ W.** course the northern end of Metinic Island will be 2 miles distant when abeam; Metinic Island Ledge buoy should be left ¾ mile on the port hand, and Mosquito and Burnt islands should be left about 1½ miles on the starboard hand. Monhegan Island should be made on the port bow and Duck Rocks tripod (down in 1902, but to be rebuilt) will be seen northward of the island.

Metinic Island Ledge is nearly ¼ mile long in an **ENE.** and **WSW.** direction, and has a least depth of 8 feet. It lies 1⅞ miles **W.** by **N.** from the northern end of Metinic Island, and is marked off its southwestern end by a buoy (spar, red and black horizontal stripes).

Hoopers Shoal is a small unmarked shoal with a depth of 17 feet over it, lying 2¼ miles **W.** from the northern end of Metinic Island and 1⅞ miles **NE.** from Roaring Bull.

Roaring Bull (Black Ledge) is awash at low water and generally marked by breakers; it lies nearly 2¾ miles **WNW. ¾ W.** from Metinic Green Island and 7¾ miles **NE.** by **E. ⅛ E.** from Monhegan Lighthouse. A buoy (can, black, No. 1) is placed about 100 yards **NW.** from the shoalest part of the ledge.

Old Cilley Ledge is about ¼ mile long in an **E.** by **S.** and **W.** by **N.** direction, with both ends dry at low tide. It lies about 1½ miles **ENE.** from Burnt Island and is marked off its eastern end by a buoy (bell, red, "O. C.").

Old Man Ledge, marked by a spindle, lies nearly 1 mile **S.** from the southern end of Allens Island. **Old Woman Ledge,** bare at half tide, and a 12-foot spot lie between Allens Island and Old Man Ledge. Vessels should pass southward of the spindle.

Duck Rocks are several detached rocks about 1 mile north of Monhegan Lighthouse. A black tripod beacon marks one of these rocks, a black spar buoy (No. 3) marks another, and a black whistling buoy is placed northward of all. Strangers should pass north of the whistling buoy.

3 A. ***From Great Duck Island Lighthouse to Monhegan, passing south of Matinicus Rock.***—When Great Duck Island Lighthouse bears *NNW.*, distant about 1 mile, steer **WSW.** about 34 miles; Matinicus Rock Lighthouses should then bear *N.*, distant 1¼ miles, and the whistling buoy *S.*, distant ¾ mile. From this position steer **WNW. ¼ W.** to pass north of Monhegan Island, or, **W. ⅞ N.** about 20 miles to pass south of the island; in either case give its shores a berth of 1½ miles. When Monhegan Lighthouse bears *N.*, distant 2 miles, follow the directions in section 4 A, following.

Remarks.—On the **WSW.** course, Long Island Head should be over 1½ miles distant when abeam. **Seal Island** will be made on the starboard bow and left 2¼ miles on the starboard hand; when it bears abeam, Matinicus Rock Lighthouses should be about 7 miles distant on the starboard bow. **At night** Saddleback Ledge Light will be made when it bears **NW.** by **W. ½ W.** Matinicus Rock Lights will be made on the starboard bow. To avoid all the dangers northward of the sailing line, keep Matinicus Rock Lights bearing westward of **SW.** by **W. ½ W.**

The distance from Matinicus Rock to Monhegan is about 20 miles. The eastern side of **Monhegan** presents high, dark, bluff, rocky faces; the lighthouse is near the middle of the island, on its highest point, about 140 feet above the sea. **At night** Monhegan Light will be made soon after passing Matinicus Rock, and on a clear night Whitehead Light may be seen to the northward.

Dangers.—Three Fathom Ledge has 3½ to 8 fathoms over it, and lies 1⅝ miles **ENE. ¾ E.** from the eastern end of Seal Island. The sea breaks on it in heavy gales.

Malcolm Ledges lie in the middle of the passage and between Seal and Wooden Ball islands. They have a length of 800 yards **NNE.** and **SSW.** and are bare at both ends, with 3 to 5 feet of water between them. **Gully Ledge,** with 6½ fathoms, lies about ⅝ mile **WSW. ½ W.** from Seal Island. **Frenchmans Ledge,** with 7¾ fathoms, lies about ¾ mile **ESE.** from the northeastern end of Wooden Ball Island.

South Breaker is a small ledge, bare at low water of spring tides, lying 1⅝ miles **NW.** by **W.** from Matinicus Rock Lighthouses; it is marked by a buoy (spar, red and black horizontal stripes) placed southwest from it.

Haddock Ledge, a small ledge with 13 feet of water over it, lies 7½ miles **ENE. ⅞ E.** from Monhegan Lighthouse and 2½ miles **SW.** from Metinic Green Island. The sailing lines pass well southward of this ledge.

Allens Shoal is a small area with 5½ fathoms water over it, lying 1⅛ miles **E.** from the northeastern point of Monhegan Island.

Duck Rocks are described under section 3.

Gull Rock Ledge has 3¾ fathoms over it, and lies about 1 mile **SSE.** from Monhegan Lighthouse and ⅝ mile from the shore of the island. To avoid this ledge give the south shore of the island a berth of over ¾ mile.

4. ***From the Whistling Buoy north of Monhegan to Wood Island Lighthouse.***—When the whistling buoy bears *S.*, distant about ¼ mile, steer **W. ¾ S.** about 14 miles; the whistling buoy off Bantam Rock will then bear *N.*, distant about ½ mile. Then:

If bound to Casco Bay or Portland.—Steer **W. ½ N.**; this course continued for 25 miles leads to Portland Head, passing about 1¾ miles south of Seguin Lighthouse and ¾ mile south of Halfway Rock Lighthouse.

To stand along shore, keeping in sight of the lights at night and passing outside of all dangers, steer **WSW. ⅝ W.** about 31 miles; Wood Island Light should then bear *NW.*, distant 4 miles. Then follow the directions in section 5 or 5 A, following.

Remarks and Dangers.—On the **W. ¾ S.** course Muscongus Bay, Johns Bay, and Damariscotta River will be on the starboard hand. Damiscove and the other islands lying off Boothbay will be on the starboard bow, and the southernmost, Pumpkin Island, should be left nearly 2¼ miles on the starboard hand. The whistling buoy off Bantam Rock should be made on the starboard bow and left about ½ mile on the starboard hand. **At night** Pemaquid Light will be in sight to the northward, and Seguin Light will be on the starboard bow. When Pemaquid Light bears about **N.**, Pond Island Light should be made northward of Seguin Light. When up to the whistling buoy off Bantam Rock, Burnt Island Light in Boothbay will be seen bearing about **N.** by **E.** and Monhegan Light will be in sight on the port quarter.

Moser Ledge, a comparatively small ledge with 17 feet over it, lies 3¾ miles **SE. ½ E.** from Pemaquid Lighthouse. The sailing line passes about 3 miles southward of it.

Outer Pumpkin Island Ledge is small and has a depth of 5¾ fathoms. It lies nearly 1¼ miles **S. ¾ W.** from Pumpkin Island, the southeasternmost of the islands lying southeastward of Boothbay. This ledge is not marked; it is left about 1¼ miles on the starboard hand.

Southeast Breaker, a small ledge with 3¼ fathoms over it, lies ¾ mile **SE. ¾ S.** from the southern end of Pumpkin Island.

Pumpkin Island Eastern Ledge, a small, unmarked ledge with 10 feet over it, lies about ⅝ mile **ESE. ¼ E.** from the southern end of Pumpkin Island.

Pinkham Shoal, a small, unmarked ledge with 12 feet over it, lies nearly ⅝ mile **SW. ½ W.** from the southern end of Pumpkin Island.

Bantam Rock shows bare at low water, and lies 1⅜ miles **SW.** by **S.** from the southern point of Damiscove Island. It is marked by a buoy (nun, red, No. 2) placed about 100 yards southwestward from the dry part of the ledge. A whistling buoy is placed 1⅞ miles **SSW. ½ W.** from the nun buoy, and a short distance southward of a small ledge, with 4 fathoms over it. Vessels standing along the coast should not pass inside of the whistling buoy.

On the **W. ½ N.** course, Sequin Lighthouse will be left 1¾ miles on the starboard hand, and Seguin Island whistling buoy should be left about ¼ mile on the port hand; Small Point will be left about 1¾ miles on the starboard hand. After passing the latter, Halfway Rock Lighthouse will be made a little on the starboard bow; it should be left about ⅝ mile on the starboard hand, and the whistling buoy about ⅝ mile on the port hand. After passing Halfway Rock, Portland Head Lighthouse should be made directly ahead (see directions for entering Portland Harbor). **At night** Halfway Rock Light should be made a little on the starboard bow when Seguin Light bears about **NW.** When abreast Cape Small, Cape Elizabeth Lights should be made on the port bow, and shortly afterward Portland Head Light will be made ahead and southward of Halfway Rock Light. The lighted buoy on Witch Rock should be looked out for. Seguin Light should be in sight on the starboard quarter until nearly up to Portland Head.

Mile Ledge, with 10 feet over it, lies ⅞ mile **S. ¾ W.** from Seguin Lighthouse; it is marked by a buoy (can, red and black horizontal stripes), placed about 100 yards **S.** from it. There is good water between this ledge and Seguin Island, but vessels standing along the coast gain nothing by passing inside. A spot with 6 fathoms over it is shown 2⅝ miles **SSW. ¾ W.** from Seguin Lighthouse. Seguin Island whistling buoy lies about ½ mile **NW.** from this spot.

For dangers crossing Casco Bay, see sailing directions under the headings "Casco Bay" and "Portland Harbor."

On the **WSW. ⅝ W.** course the sailing line leads well outside Casco Bay and the outlying ledges. Halfway Rock Lighthouse will be left about 7 miles on the starboard hand, and Cape Elizabeth Light-vessel about 1½ miles on the starboard hand. Wood Island Lighthouse will be made well off the starboard bow, and when it approaches a **NW.** bearing, Goat Island Lighthouse and Cape Porpoise will be made a little on the starboard bow. **At night** Halfway Rock Light will be made broad off the starboard bow when Seguin Light bears about **NNW.**; Cape Elizabeth Lights and Portland Head Light will be made shortly afterwards in the order named, when Cape Small is abeam. When Halfway Rock Light approaches a **NW.** bearing, Cape Elizabeth Light-vessel should be made a little on the starboard bow and should be left about 1½ miles on the starboad hand. When nearly up to the light-vessel Wood Island Light will be made on the starboard bow, and when it bears about **WNW.** Goat Island Light will be made a little on the starboard bow.

4 A. ***From a position about 1 1-2 miles S. of Monhegan Island.—If bound to any port between Boothbay and Cape Elizabeth.***—Steer **W. ½ N.**; this course continued for 39½ miles leads up to Portland Head, passing ½ mile *S.* of the whistling buoy off Bantam Rock, 1¾ miles *S.* of Seguin Lighthouse, and ¾ mile *S.* of Halfway Rock Lighthouse.

Or, to stand along shore, keeping in sight of the lights at night and passing outside of all dangers, steer **W. ¾ S.** for 45 miles. Wood Island Lighthouse should then bear *NW.*, distant 4 miles. Then follow the directions in section 5 or 5 A, following.

Remarks.—On the **W. ½ N.** course Damiscove and the other islands lying off the entrance to Boothbay will be left about 3¼ miles on the starboard hand. The whistling buoy off Bantam Rock should be made on the starboard bow, and left ½ mile on the starboard hand. (See also the remarks under section 4, preceding.) **At night,** to avoid the whistling buoy off Bantam Rock, keep Monhegan Light bearing northward of **E. ¼ N.** until the white ray of Burnt Island Light in Boothbay bears **N.** by **E. ½ E.**

On the **W. ¾ S.** course the sailing line leads nearly 4 miles south of the nearest dangers. Seguin Light, Halfway Rock Light, Cape Elizabeth Lights, Portland Head Light, and Wood Island Light will be made broad off the starboard bow in the order named. Cape Elizabeth Light-vessel will be made on the starboard bow, and should be left about 2¾ miles on the starboard hand. When Wood Island Light bears about **WNW.** Goat Island Light should be made ahead.

5. ***From Wood Island Lighthouse to Cape Ann.—To pass westward of Boon Island and Isles of Shoals.***—With Wood Island Lighthouse bearing *NW.*, distant 4 miles, steer **SW. ¼ W.** about 32½ miles; Isles of Shoals Lighthouse should then bear *ESE.*, distant nearly 2 miles. The course from this position is **S. ¼ E.** about 18 miles, when Straitsmouth Lighthouse should bear *WSW.* and be in range with the beacon on the Dry Salvages, the latter being 1¼ miles distant on the starboard hand. Then steer **S.** by **W. ¾ W.** and pass about 1 mile *E.* of Cape Ann Lighthouses.

Remarks and dangers.—On the **SW. ¼ W.** course, after having made a little over 20 miles, Boon Island Lighthouse should be 1¾ miles distant on the port beam, and Cape Neddick about 3¾ miles on the starboard hand. The entrance to York River will be seen southwestward of the cape. When about 3¾ miles past Boon Island, York Ledge should be nearly on the starboard beam and left about 1¼ miles on the starboard hand; about 1¾ miles farther, Murrays Rock should be left 1¼ miles on the starboard hand. Duck Island, the northernmost of the Isles of Shoals, should be left about 1 mile on the port hand. The entrance to Portsmouth Harbor will be about 3¾ miles off the starboard beam. Appledore Island, the largest of the Isles of Shoals, and some of the other islands, have hotels which show conspicuously. **At night** Goat Island Light will be broad off the starboard bow, and Boon Island Light will be made on the port bow. After passing Goat Island Light, Cape Neddick Light should be made on the starboard bow, and when it bears about **W.** Isles of Shoals Light will be made on the port bow, if not shut in by the hotels on the islands northward. Whaleback Light, at the entrance to Portsmouth Harbor, should be made about the time that Boon Island Light bears abeam. Portsmouth Harbor (Newcastle) Light will open out on the starboard beam when nearly abreast the northern end of the Isles of Shoals. When abreast the Isles of Shoals, Newburyport Light should be made a little on the starboard bow.

Boon Island is a small, low, rocky islet, about 5¾ miles **SE. ⅝ E.** from Cape Neddick; it is marked by Boon Island Lighthouse. The island is surrounded by deep water, but there are several detached ledges eastward and one southwestward of it.

Pollock Rock, with 17 feet over it, is a small ledge lying ¾ mile **WSW. ¼ W.** from Boon Island Lighthouse. There is a depth of 10 fathoms between this rock and Boon Island, but vessels should not attempt to pass between them. The sea breaks heavily over the rock in strong gales.

Boon Island Ledge, showing bare at extreme low tides, lies 2¾ miles **E. ½ S.** from Boon Island Lighthouse. A whistling buoy (red and black horizontal stripes, "B. I. L." in white letters) is placed about 300 yards southeastward of it. Commencing about 1⅝ miles **E.** of Boon Island Lighthouse and extending toward Boon Island Ledge is a ledge with from 4½ to 8½ fathoms over it on which the sea breaks in heavy weather.

York Ledge is about ¾ mile long in an **ENE.** and **WSW.** direction, and shows partly bare at three-quarters ebb. It lies about 4 miles **S.** by **W.** from Cape Neddick Lighthouse, and is marked by a spindle (iron, 28 feet high, with cage on top). The sunken part of the ledge extends about ½ mile northeastward and ¼ mile westward from the spindle.

The Triangles is an extensive shoal ground, nearly 1 mile in diameter, with 4 to 6 fathoms of water; its eastern end is about 4¼ miles **E. ¼ S.** from Whaleback Lighthouse and 1⅝ miles **SW.** by **S.** from the spindle on York Ledge. **Murrays Rock,** with 6 feet over it, is near the southeastern side of The Triangles; it is marked by a buoy (nun, red and black horizontal stripes) placed about 100 yards **SSE.** from the shoalest part of the rock. Vessels coming from northward should pass at least ½ mile eastward of this buoy. There are **spots** with 4 to 6½ fathoms over them between The Triangles and York Ledge, and with 3¼ to 6 fathoms between The Triangles and the northern point at the entrance to Portsmouth Harbor.

Isles of Shoals (see description under that heading). Vessels standing along the coast westward of the islands will avoid all dangers by giving them a berth of about ½ mile.

On the S. ¼ E. course, White Island whistling buoy will be left ¼ mile on the port hand when Isles of Shoals Lighthouse bears about NE. Cape Ann and Straitsmouth lighthouses will be made off the starboard bow. The beacon on the Dry Salvages will show conspicuously on a clear day; it should be left 1 mile to 1½ miles on the starboard hand on this course. At night Whaleback and Portsmouth Harbor lights will be a little open astern. Cape Ann Lights will be made soon after passing Isles of Shoals. Ipswich and Annisquam lights will be made broad off the starboard bow. Straitsmouth Light will be made off the starboard bow when Newburyport Light bears about W. To clear the Dry Salvages, do not approach Straitsmouth Light from northward nearer than 1¾ miles until Cape Ann Lights bear westward of SSW. ¾ W., and steer so as to pass about 1 mile eastward of them.

Dry Salvages and other dangers lying northeastward of Straitsmouth Lighthouse are described under heading "Sandy Bay and Rockport Harbor;" they are avoided by giving Straitsmouth Light a berth of 1½ miles.

On the S. by W. ¾ W. course the spindle on the Londoner will be made on the starboard bow and should be left ¼ mile on the starboard hand.

5 A. ***From Wood Island Lighthouse to Cape Ann.—To pass eastward of Boon Island.—*** From a position 4 miles *SE.* of Wood Island Lighthouse, steer **SSW. ⅝ W.** This course made good about 49 miles leads about 4¾ miles *E.* of Boon Island and to a position about 1 mile *E.* of Cape Ann Lighthouses.

Remarks.—On this course, when Boon Island Lighthouse bears W. ¾ N., the whistling buoy off Boon Island Ledge should be in range with the light distant about 2 miles. On a clear day the Isles of Shoals will be made off the starboard beam distant about 7½ miles. Cape Ann will be made on the starboard bow, and as it is approached Cape Ann Lighthouses and Thatcher Island should be readily distinguished. The beacon on Dry Salvages should be left about 1½ miles on the starboard hand. At night Boon Island Light will be made when Goat Island Light bears about W.; Cape Neddick Light will be made broad off the starboard bow. When Boon Island Light bears about W., Isles of Shoals Light will be made, and on a clear night Whaleback Light will be visible just forward the starboard beam. When Isles of Shoals Light bears about WNW., Cape Ann Lights should be made on the starboard bow, and as they are approached, if the night is clear, the lights in Ipswich Bay will be visible. Straitsmouth Light will be made when about 13 miles distant from Cape Ann Lights.

Dangers.—Boon Island and the adjacent dangers are described under section 5 preceding. The sailing line passes 2 miles eastward of Boon Island Ledge and the whistling buoy. (See also heading "Sandy Bay and Rockport Harbor" for dangers northeastward of Cape Ann.)

ST. CROIX RIVER AND APPROACHES.*

The St. Croix River forms part of the boundary between the United States and New Brunswick, and is of some commercial importance; the entrance is approached through several channels leading between the islands on the New Brunswick side and the shore of the United States. The waters comprising the approaches to the St. Croix River—Quoddy Roads, Lubec Narrows, Friar Roads, and Passamaquoddy Bay—have numerous tributary bays and rivers, the principal ones on the shore of the United States being Johnson Bay and Cobscook Bay; the latter is the approach to South Bay, Pennamaquan River, and the North and South Branch Cobscook rivers. With the exception of Lubec Narrows, Cobscook Bay and tributaries, and the upper part of the St. Croix River, these waters are exceptionally free from dangers; the shores are bold-to along the channel ways with but few exceptions. The tidal currents are strong, and sailing vessels can make no headway beating against them.

A detailed description of the approaches to the St. Croix River follows in the order in which they would be used in approaching from a port in the United States.

QUODDY ROADS AND LUBEC NARROWS.

Quoddy Roads lies between the southwestern end of Campobello Island and West Quoddy Head, marked by a lighthouse; it is the usual anchorage for vessels seeking shelter against northerly and westerly winds or waiting for a favorable tide to pass through Lubec Narrows. The entrance between Liberty Point Ledge and West Quoddy Head is about ¾ mile wide, with a least depth of 28 feet near the middle of the entrance; the

* St. Croix River shown on chart **300**, scale $\frac{1}{40,000}$; Quoddy Roads and Approaches to St. Croix River shown on chart **301**, scale $\frac{1}{40,000}$, price of each $0.25; both are shown on chart **101**, scale $\frac{1}{80,000}$, price $0.50.

best water leads about ¼ mile eastward of West Quoddy Head (see current notes). The anchorage affords shelter against all but east and southerly winds in 12 to 25 feet of water at low tide; vessels anchored here for shelter when the wind hauls eastward, get under way and pass through Lubec Narrows to the anchorage in Johnson Bay. The western part of the roads between West Quoddy Head and Lubec is full of shoals, partly bare at low water, on which are numerous fish weirs.

The **channel** leading from the roads to Lubec Narrows is being improved by dredging; it has now (1902) a least width of 370 feet and a depth of 12 feet throughout at mean low water, but low spring tides may fall 4 feet below this level. It is proposed to widen this channel to 500 feet throughout its whole length. On its western side and about ¾ mile **S. ¼ W.** from Leadurny Point, it is marked by **Lubec Channel Lighthouse** (see table, page 16). The turns in the channel are marked by buoys. The average draft of vessels passing through this channel is 12 feet; the deepest draft is 19 feet. It is necessary for sailing vessels to have a fair wind to pass through the dredged channel and the Narrows, the most favorable time being about 2 hours before high water, but sailing vessels with a strong, fair wind can stem an adverse current at any time after half flood or ebb.

Lubec Narrows is a narrow strait between Mulholland Point (marked by a lighthouse) and the town of Lubec. The channel is straight but narrow, with very strong tidal currents and eddies; the flood current has a velocity of 6 miles and the ebb 8 miles during spring tides (see current notes). The town of **Lubec** is situated on the northern side of West Quoddy Roads, on a peninsula separating the roads from Johnson Bay; it is of little commercial importance. The wharves in the Narrows are all dry at low water, and are only used by small vessels which sometimes ground out here for repairs. The steamboat wharf is on the north end of the town inside the Narrows, and has a depth of 12 feet at its end.

JOHNSON BAY

is the bight on the northwest side of Lubec, about 2½ miles **SSW.** from Eastport. This is a well-sheltered anchorage for vessels of any draft, and much frequented by vessels of all sizes in the spring and fall; it is approached from southward through Quoddy Roads and Lubec Narrows, and from northward through Friar Roads. The southwestern part of Johnson Bay is shoal, the best anchorage for deep-draft vessels being just southward of a line from Mulholland Point Lighthouse to Rodgers Island.

FRIAR ROADS (EASTPORT HARBOR)

is on the western side of Campobello Island, north of Johnson Bay and east of Moose Island (Eastport); it is approached from northward around East Quoddy Head, and from southward through Quoddy Roads and Lubec Narrows, and is the principal approach to Passamaquoddy Bay and St. Croix River. Vessels seldom anchor in Friar Roads, as the water is deep and the bottom, as a rule, foul.

De Lute Harbor, in the northwestern part of Campobello Island, is sometimes used as an anchorage by small vessels.

Friar Bay, a broad bight in the west shore of Campobello Island, **SSE.** from Eastport, is sometimes used as an anchorage.

Broad Cove, in the south shore of Moose Island, and west of Eastport, is a good anchorage for vessels of any draft; vessels anchored off Eastport get under way and anchor here or in Johnson Bay to ride out a gale.

The **channel** leading into Friar Roads from northward is deep and unobstructed; the shores are bold-to and the few ledges can be avoided by noticing the ranges of some of the islands.

Eastport is situated on the southeastern end of Moose Island. It is of some commercial importance, its principal business being in lumber, fish, and general merchandise. Vessels loading generally lie at the wharves, some of which are dry at low water; others have from 5 to 12 feet at their ends. The best anchorage off the town is abreast the custom-house and quite close to the wharves, where the current has the least velocity. The passage leading into Passamaquoddy Bay and St. Croix River is just northward of the town and the entrance to Cobscook Bay, south of it.

Pilots.—As pilotage is not compulsory, Canadian pilots can take vessels into Maine ports, but Maine pilots are not allowed to take vessels into Canadian ports. Vessels coming from eastward will find Canadian pilots cruising off Machias Seal Island, or, if not there, at Little River, where both American and Canadian pilots will be found. If a pilot is not taken offshore, Canadian licensed pilots, and fishermen who are competent pilots for Maine ports, will be found at Head Harbor, near the north end of Campobello Island. Vessels coming from westward may take a pilot off Little River or at West Quoddy Roads. Pilots for St. Croix River and Cobscook Bay can be found at Eastport.

Supplies.—Coal, in limited quantity, and water can be had alongside some of the wharves. Provisions and some ship-chandler's stores can be obtained in the town.

Repair.—Light repairs can be made, vessels being hauled out on the beach to be cleaned and calked.

Communication.—Steamers stop at Eastport on their trips from Boston, Mass., to St. John, N. B., and return. Eastport has railroad communications with Calais and towns westward.

Storm warning displays of the U. S. Weather Bureau are made from the custom-house, and show well to the shipping in Friar Roads; displays are also made at West Quoddy Head.

Marine Hospital.—Relief is furnished under the provisions of the regulations for the U. S. Public Health and Marine-Hospital Service as for stations of Class III. (See Appendix IV.)

COBSCOOK BAY,

making in westward of Moose Island, in a large, irregular bay with several arms It is approached through the channel leading between Moose Island on the north and Seward Neck on the south. The arms of the bay are full of rocks and have dangerous currents, which require local knowledge to keep a vessel in the channels. The towns of **Pembroke, Dennysville,** and **Whiting** are situated on its shores. Strangers seldom enter Cobscook Bay, and then only with a pilot, generally taken at Eastport. Good anchorage is found in the coves that are not too full of rocks, but everywhere in the channel the currents are too strong and the bottom too rocky for anchorage. Ice obstructs navigation during the winter.

PASSAMAQUODDY BAY

is a large, irregular bay indenting the shore of New Brunswick east of the mouth of the St. Croix River. The principal entrance to the bay is between Deer Island on the east and Moose Island (Eastport) on the west, which is also known as the **Western Passage of St. Croix River.** This passage has good water and is comparatively free from dangers; it is 4 miles long from Eastport to the town of **Perry,** where it joins Passamaquoddy Bay. The bay between Perry and St. Andrew Island is free from dangers; the western and northern shores of Deer Island are bold-to, except in the coves.

Four miles north of Eastport is **Gleason Cove,** an indentation on the western shore of the entrance of Passamaquoddy Bay. Emptying into it is the small stream known as Little River, leading up to the village of Perry, a place of small commercial importance.

The Canadian town and port of **St. Andrew** is near the eastern point at entrance to the St. Croix River. It is a railroad terminus and has a little commerce; the anchorage which is between it and St. Andrew Island is only available for light-draft vessels. A lighthouse marks the entrance to the inner harbor.

The village of **Robbinston,** Maine, opposite St. Andrew, on the west bank at the entrance to St. Croix River, is of little importance.

ST. CROIX RIVER

empties into the western end of Passamaquoddy Bay from northward; for a distance of 5¼ miles, from Robbinston to Devils Head, its least width is ⅛ mile. At Devils Head the river makes a sharp bend westward and narrows rapidly to **The Ledge,** a village on the New Brunswick side, 2 miles above. In several places above this point the river narrows to a width of 300 yards and can be navigated by sailing vessels only at high water.

The depth of water in the river below Devils Head remains stationary, but above this the sawdust from lumber mills farther up the river is gradually filling up the channel and forming flats which prevent navigation above The Ledge except at high water. Vessels can anchor and lie afloat below The Ledge, but above this and at Calais they lie aground at low water. There are comparatively few dangers in this river; the currents are strong (see remarks about currents), and by taking advantage of them the navigation of the river up to The Ledge is simple; above this a pilot or towboat should be employed. Vessels may anchor anywhere in the river where the currents are not too strong or the water too deep.

Red Beach is a small village of no commercial importance, on the west bank of the river abreast of Dochet Island, marked by **St. Croix River Lighthouse** (see table, p. 16); the latter lies nearly in the middle of the river and is ⅛ mile from the eastern shore; the best water is eastward of the island.

The Ledge is a small village on the north bank of the river about 2 miles above Devils Head. Here are two small, square, white lighthouses, one on Spruce Point below, the other on Mark Point above The Ledge. Abreast the village and on the west side of the channel is a fender pier to keep the current from setting vessels aground.

St. Stephen, on the north bank of the river, opposite Calais, is connected with the latter by a bridge just above the wharves. It has considerable trade in lumber and is the terminus of a railroad with connections through Canada.

The city of **Calais** on the south bank of the river, about 11 miles above its mouth and 23 miles above Eastport, is of considerable commercial importance and has a large lumber trade; it is a terminus of a railroad running through Maine and into Canada. Vessels up to 19 feet draft come here to load lumber, coming up the river at high water and lying aground while loading. There is only 4 feet at low water in the channel for some distance below the city, and this depth is said to be decreasing owing to the sawdust which comes down the river from the lumber mills above. The usual draft of vessels going to Calais is about 12 feet.

Pilots.—Strangers should take a pilot or towboat to go above The Ledge; pilots are found here ready to take vessels up at high water.

Supplies.—Anthracite and bituminous coal can be had alongside the wharves at Calais. Water is taken from the river at low water. Provisions and some ship-chandler's stores can be obtained.

Repairs to vessels' hulls can be made at Calais; there is one drydock 150 feet long and 28 feet broad and one marine railway of about the same dimensions.

Ice.—During January, February, and March the St. Croix River is obstructed by ice and not navigable above Robbinston.

TIDES—ST. CROIX RIVER AND APPROACHES.

It is high water at Eastport 11 hours 9 minutes after the moon's meridian passage.

	Time of high water before or after time of high water at Eastport.	Average rise of tides.
	h. m.	*Feet.*
West Quoddy Head	0 14 before.	15.2
Lubec	0 05 "	18.3
Cobscook Bay (Deep Cove)	0 11 after.	19.4
Gleasons Cove	0 05 "	18.4
Robbinston	0 09 "	19.8
St. Croix River Lighthouse	0 16 "	19.9
The Ledge	0 21 "	20.0
Calais	0 28 "	20.3

More complete tidal data for Eastport is given in the table on page 27. See also the tide tables for the Atlantic coast of the United States, in which the tides for Eastport are predicted for every day of the current year.

Southeasterly gales sometimes cause very high tides at Eastport.

TIDAL CURRENTS—ST. CROIX RIVER AND APPROACHES.

In the Grand Manan Channel the flood sets in a general **NE.** direction, and at strength attains a velocity of about 3 miles. The ebb sets in a southwesterly direction with a velocity at strength of about 3 miles.

Approaching the entrance to Quoddy Roads, if less than 2 miles from the northern shore, the set of the flood is more northward, and about 1 mile southeastward of West Quoddy Head, the flood sets directly into the Roads. For a distance of ¼ mile southeastward of West Quoddy Head the currents are dangerous on account of swirls and eddies, which are apt to draw a vessel, in a light breeze, on to Sail Rock.

Along the eastern side of Campobello Island the flood sets in a northeasterly direction following the trend of the shore, the ebb setting in a contrary direction.

Along the northwestern side of Campobello Island, 1 mile north of East Quoddy Head, the flood sets strong to the westward on to the islands lying in the passage westward of Campobello Island. The direction of the flood then changes more southward, following the general direction of the passage until nearly to Eastport, where the set is more westerly, toward the passage between Deer and Moose islands and toward the entrance to Cobscook Bay. The ebb generally sets in a reverse direction.

Through Lubec Narrows the flood sets northward, following the general direction of the dredged channel; southward of the Narrows it has a velocity of about 4 miles at strength, but in the Narrows it attains a velocity of about 6 miles during spring tides. The ebb sets southward, following the general direction of the channel, and in the Narrows has a velocity of about 8 miles during spring tides. Below the Narrows its

velocity is about 4 miles, and the set is in the general direction of the channel. The currents at strength form dangerous eddies on both sides of the channel in the Narrows; these are avoided by keeping in mid-channel. It is slack water in the Narrows about 1 hour before high and 1½ hours before low water: the duration of slack is short, from 5 to 15 minutes. With a strong fair wind small sailing vessels can pass through the Narrows with an adverse current at any time after the current has been running 3 hours.

Northward of Lubec Narrows the first of the flood current sets along the west shore of Campobello Island eastward of Popes Folly; it afterward sets more westward, south of Popes Folly, and across the entrance of Johnson Bay, meeting the flood from Friar Roads westward of Treat Island, and both setting into Cobscook Bay.

In the Western Passage of St. Croix River.—The flood sets northward into the passage, and off Deer Point, abreast Dog Island, it forms whirlpools and eddies which are dangerous and have been known to draw down boats of about 12 tons. The whirlpools and eddies are strongest 2 to 3 hours before high water and during spring tides; the flood then attains a velocity of 6 to 7 miles. The least disturbance is usually about 300 yards northward of Dog Island, where there is a comparatively narrow direct current known locally as "straight water," which can be readily followed between the whirlpools and eddies on the Deer Island side and the eddies on the Eastport side of the passage. The ebb sets southward, but does not attain the velocity of the flood.

Above Deer Point the flood sets northward with decreasing velocity and follows the general direction of the channel with strong countercurrents and eddies close to the shore where the conformation of the land is favorable; it continues ½ to ¾ hour after the time of high water. The ebb sets southward with reduced velocity and disturbance off Deer Point, and the inshore reverse currents are less marked than on the flood; it continues ¾ to 1 hour after the time of low water.

St. Croix River above St. Andrew Island.—The flood sets northward with countercurrents inshore on both sides where the conformation of the land is favorable for them. The ebb sets southward with less marked counter-currents.

Cobscook Bay and Tributaries.—The tidal currents follow the general direction of the channels, but in the coves there are strong reverse eddy currents, and heavy overfalls are formed over the submerged rocks and ledges. The velocity is estimated at 5 to 8 miles, and some of the buoys are towed under when the currents are at strength.

Complete observations to determine the set and velocity of currents in these waters have never been taken. The above remarks include extracts from the notes and observations taken by Lieut. F. H. Crosby, U. S. N., Assistant Coast and Geodetic Survey, while engaged in a hydrographic survey of St. Croix River and Cobscook Bay in 1887–88; also the results of observations by the U. S. Engineers in Lubec Narrows in 1878, and the notes of a Coast Pilot party on the ground in 1887, 1890, and 1902.

SAILING DIRECTIONS, EASTPORT HARBOR.

1. ***Approaching and Entering, by the Passage Northward of Campobello Island.***—With West Quoddy Head Lighthouse bearing *W.*, distant 2¼ miles, steer **NE.** by **N.** about 6 miles; Head Harbor Lighthouse should then bear about *NNW.* Then change course to **N.** by **W.** ½ **W.** so as to leave this lighthouse at least 500 yards on the port hand; when it bears *S.*, distant about 500 yards, steer about **WSW.** ½ **W.**, following the northern shore of Campobello Island at a distance of about 500 yards. When the northern end of Green Island bears *NW.* by *W.* steer about **SW.** ¾ **W.**, heading so as to pass about ¼ mile eastward of the city of Eastport. Stand over toward the wharves of the city (see heading Eastport, page 38).

Or, destring to anchor in Broad Cove.—Continue the **SW.** ¾ **W.** course, leaving Buckman Ledge buoy (nun, red, No. 2) about 100 yards on the starboard hand; when past this buoy bear westward so as to leave Estes Head at least 150 yards on the starboard hand. When Broad Cove is well open steer about **N.** by **W.** ¾ **W.**, giving the eastern shore a berth of about 250 yards, and anchor in 4 to 8 fathoms water, soft bottom, when inside Shackford Head, the western point at the entrance, bearing about *W.*

Remarks and dangers.—On the **NE.** by **N.** course the shores of Campobello Island, high and bold, will be left about 1 to 1½ miles on the port hand. The tidal currents generally follow the trend of the shore. All dangers will be avoided by giving the eastern shore of Campobello Island a berth of ¼ mile.

On the **WSW.** ½ **W.** course the shore of Campobello Island can be approached as close as 100 yards; Casco Island, Green Island, Sandy Ledge, and Pope Island will be seen on the starboard bow in the order named, and can be approached to 200 yards on their southern sides except Pope Island.

Black Rock is the name of two small, bare rocks about ⅞ mile **NW. ¾ W.** from Head Harbor Lighthouse; it should be given a berth of not less than 150 yards.

There is a spot with 27 feet over it lying a little over ¼ mile **SE. ½ E.** from Green Island. Vessels usually follow along the shore of Campobello Island, which can be approached as close as 100 yards, passing eastward of this spot.

Pope Shoal is a small shoal with 10 feet over it lying about 350 yards **SE.** from Pope Island; the sailing line passes well eastward of this shoal.

On the **SW. ¾ W.** course **Indian Island,** a large island, and the city of Eastport will be on the starboard bow. **Thrumcap** and **Cherry** islands, two small, high, wooded islands off the southeastern end of Indian Island, will be left on the starboard hand, and when nearly up to these islands **De Lute Harbor** entrance will be open on the port beam. After passing Cherry Island the passage between Deer and Moose islands (entrance to Passamaquoddy Bay) will be opened northwestward. The course leads for a white can buoy which is left on either hand.

Margies Rock has 14 feet over it and is a small rock lying 150 yards from the wharf line of Eastport; 200 yards southward of this rock and about 150 yards from the wharf line is **Pages Rock** with 16 feet over it; these rocks are not marked. Union Wharf bears about **NNW.** from Pages Rock.

Buckman Ledge makes out about 250 yards southward from Buckman Head (southern part of Eastport). It is marked at its southern edge by a buoy (nun, red, No. 2).

When rounding the southern end of Moose Island to enter Broad Cove, **Treat Island,** large, high, and partly wooded, will be left on the port hand. The entrance to Cobscook Bay, between Moose Island and Seward Neck, will be opened northwestward.

On the **N. by W. ¾ W.** course standing into Broad Cove the eastern edge of Treat Island will be astern, and, at low water, the rocks and ledges off Shackford Head and the flats in the head of Broad Cove will show out of water.

Shackford Ledge is a cluster of rocks, many of them showing bare at low water, making off nearly 400 yards southeastward and southward from Shackford Head. At the southern edge of the ledge is a buoy (spar, red, No 4).

Desiring to anchor in Friar Bay.—When abreast the wharves at Eastport steer about **S.** and anchor in the bight in 5 to 11 fathoms of water, soft bottom.

Desiring to anchor in Johnson Bay.—When abreast the wharves at Eastport, steer about **SSW. ¾ W.,** heading between Treat Island and Friar Head; Popes Folly, a small island, should be ahead. Pass about midway between Popes Folly and Dudley Island, the inland northwestward, and steer about **SW.** by **W. ¾ W.** Anchor in 5 to 7 fathoms of water, soft bottom, a little southward of a line between Rodgers Island and Mulholland Point, and *NW.* from the town of Lubec.

Standing down for an anchorage in Johnson Bay the passage eastward of Treat Island and between Dudley Island and Popes Folly is free from dangers; a good rule is to give the islands a berth of about 200 yards. The white can buoy eastward of Treat Island is left on either hand.

A small rock, showing bare at extreme low tides, lies about 200 yards north of the northern end of Treat Island.

There are several spots with 17 and 17½ feet over them in the middle of Johnson Bay; these spots can be avoided by keeping a little eastward of the middle of the entrance when standing in for an anchorage.

1 A. ***Approaching and Entering, from Southward, through Quoddy Roads.***—These directions are good for vessels of 14 feet draft at high water; strangers of deeper draft should employ a pilot, as local knowledge is necessary to handle a large vessel in the narrow channel with strong tidal currents. The tidal currents in the dredged channel and Lubec Narrows have great velocity, and vessels desiring to pass through from Quoddy Roads should do so on the last of the flood. Vessels bound through the Narrows from Eastport usually pass through at high water slack, which occurs about 1 hour before high water. (See also "Tidal currents," page 40.)

From a position close to Sail Rock whistling buoy, with West Quoddy Head Lighthouse bearing *NW.* by *N.* distant nearly ¾ mile, steer about **N. ½ W.** so as to pass ¼ mile eastward of Sail Rock and the lighthouse. When inside the entrance to Quoddy Roads, and the lighthouse bears about *SW.*, steer **NW. ½ W.** with Middle Ground buoy (nun, red, No. 2) a little on the starboard bow. If the wind and tide are not favorable anchor about 150 yards southward of the Middle Ground buoy in 3½ to 4½ fathoms, soft bottom.

Or, bound through Lubec Narrows.—Leave Middle Ground buoy (nun, red, No. 2) about 100 yards on the starboard hand and steer about **N.** by **W.** for Lubec Channel Lighthouse; when about ¼ mile from the lighthouse leave South End of Dredged Channel buoy (spar, black, No. 1) 30 yards on the port hand, and steer about **N.** ½ **W.** so as to leave Lower buoy (nun, red, No. 4) on the starboard hand, and the lighthouse and West Side of Dredged Channel buoy (spar, black, No. 3) about 50 yards on the port hand. From black spar buoy No. 3 the course is about **NE.** by **N.** for Cranberry Point buoy (nun, red, No. 6), which is left 40 yards on the starboard hand; from this buoy haul northward so as to leave The Gin Bottle buoy (can, black, No. 5) 30 yards on the port hand, and then steer about **N.** by **W.** ½ **W.** so as to pass about 100 yards eastward of Leadurny Point. When abreast this point steer about **N.**, heading for Popes Folly (a small, wooded island), and pass through Lubec Narrows on this course, leaving Upper buoy (spar, black, No. 7) 25 yards on the port hand, and then:

Bound to Johnson Bay.—Steer about **W.** by **N.** for ½ mile and anchor in 7 fathoms just inside of a line from Mulholland Point to Rodgers Island.

Bound to Eastport.—Stand westward about ¼ mile, and then steer **NE.** and pass in mid-channel between Popes Folly and Dudley islands. Continue the course until up with the white can buoy, and Treat Island (the largest island in this part of Friar Roads) is abeam; then haul up for the city of Eastport, course about **N.** by **E.** ½ **E.**

Bound to Broad Cove.—Proceed as directed in the preceding paragraph until the north end of Treat Island is abeam, and then change course to **NW.** ½ **N.**, taking care to leave Treat Island over 300 yards on the port hand. When up with Estes Head enter Broad Cove as directed in section 1, page 41.

Or, from Upper buoy (spar, black, No. 7) steer about **NW.**, passing over 250 yards south of Popes Folly and Dudley islands, and then steer about **N.** so as to leave Dudley Island, Gull Rock (shows above water), and Burial Island (small island northwest of Treat Island) about 400 yards on the starboard hand. When abreast Burial Island steer about **N.** by **E.**, heading into Broad Cove, slightly favoring the eastern shore, and anchor when inside Shackford Head, the western point at the entrance, in 4 to 8 fathoms.

Remarks and dangers.—**Sail Rock** and **Little Sail Rock** are two bare rocks of a group of ledges which lie ¼ mile **SSE.** ¼ **E.** from West Quoddy Head Lighthouse; eddies and whirlpools form just southward and eastward of Sail Rock during the strength of the tidal current, and it should be given a good berth. A black whistling buoy is moored ⅝ mile **SSE.** ½ **E.** from West Quoddy Head Lighthouse and about ⅝ mile outside of Sail Rock.

Round Rock and **Liberty Point Ledge** lie a little over ¼ mile westward of Liberty Point, the eastern point at the entrance to Quoddy Roads. These rocks show above water, and vessels should pass at least 300 yards southward of the southernmost rock.

Middle Ground, with a least depth of 4 feet, is a large shoal in the middle of Quoddy Roads. It is marked on its southwestern side by a buoy (nun, red, No. 2), which lies ⅜ mile **NNW.** ½ **W.** from the northeastern point of West Quoddy Head.

Wormell Ledges lie along the southern shore of Quoddy Roads westward of West Quoddy Head; they have from 1 to 5 feet over them and are mostly bare at low spring tides; they are not marked. The western edge of these ledges is a little over ¼ mile from the shore and bears about **SSW.** from Lower Middle Ground buoy (nun, red, No. 2).

The western part of Quoddy Roads is full of shoals, which extend out ¾ mile from the shore and are largely bare at low water. On the northern side of Quoddy Roads are extensive shoals which extend out a little over ⅝ mile.

Standing from Quoddy Roads and through Lubec Narrows, **Lubec Channel Lighthouse** (see table, page 16) and the buoys are the only guides for a stranger and should be closely followed. The channel is narrow (see page 38) and leads between rocks and shoals, largely bare at low water, and the tidal currents run with great velocity in the Narrows, forming eddies and swirls on both sides of the channel (see current notes, page 40). Fish weirs are placed on both sides of the channel between black spar buoy No. 1 and Leadurny Point.

There are **shoals** and **ledges**, bare at low water, on both sides of the channel in the Narrows but they are not marked. Making off from the northeastern point of Lubec, and opposite the lighthouse on Mulholland Point is a dangerous ledge, upon the shore end of which is built a jetty which shows out of water; the northern end of this ledge is marked by a buoy (spar, black, No. 7), which also marks the western side of the northern end of the dredged channel.

Standing northward from Lubec Narrows a good rule is to give the islands in the southern part of Friar Roads a berth of over 200 yards. There is a small rock, bare at extreme low tides, about 200 yards north of the northern end of Treat Island. A rock with 8 feet over it lies on the western side of the channel about 400 yards from the eastern shore of Seward Neck and nearly ¾ mile **NW.** by **W.** from Burial Island.

SAILING DIRECTIONS, ST. CROIX RIVER.

Sailing vessels should not attempt to enter the river except with a favorable tide or a strong fair wind, as no headway can be made against the strong tidal currents. The directions are good for vessels of the deepest draft as far as Devils Head; above this some local knowledge is necessary to keep in the best water. Vessels of 8 feet draft can pass up to The Ledge, at low water, by following the directions.

Current note.—Before entering this passage consult the current note, "In the Western passage of St. Croix River," page 41.

1. ***From Eastport to the Entrance.***—Having followed the directions for Eastport Harbor, pages 41–43, give the shore of Moose Island (Eastport) a berth of at least 400 yards and stand northward, following the trend of the shore. Pass about 250 to 300 yards northeastward of Dog Island, and when it bears *SW.* make good the course **N.** by **W.**, so as to pass about 350 yards westward of Clam Cove Head. Continue the **N.** by **W.** course past the head and then steer a little more northerly, following the general trend of the western shore, giving it a berth of at least 400 yards. Stand into the entrance, course about **N.**, favoring the western shore, and be guided by the directions in section 2, following.

Remarks.—When standing northward to enter the passage into Passamaquoddy Bay between Deer and Moose Islands, **Indian Island**, large, partly wooded, with several wharves and houses near its southern end, will be left on the starboard hand. **Dog Island**, a small rocky island with grassy top, close to the northeastern point of Eastport, should be left about 300 yards on the port hand. **Deer Point**, the southern point of Deer Island, is nearly ¼ mile **NE.** from Dog Island.

On the **N.** by **W.** course **Johnson Cove**, a broad bight in the western shore 1 mile above Dog Island, will be passed; this is a good anchorage not affected by the tidal currents. **Kendall Head** is the headland northward of Johnson Cove and southward of the northern entrance to Cobscook Bay, which is an intricate and shallow passage obstructed by a railroad and a wagon bridge connecting Moose Island with the mainland and with Carlow Island; the latter lies in this entrance. **Cummings Cove** is a small bight in the eastern shore opposite Kendall Head. **Clam Cove**, or **Fair Haven**, in the eastern shore, about 1¾ miles above Kendall Head, has good anchorage in 3 to 10 fathoms of water; **Clam Cove Head** is the northern point at entrance to the cove.

Gleason Cove is a bight in the western shore, about 2½ miles above Kendall Head. There is a good anchorage in westerly winds at the mouth of the cove. Above Gleason Cove the directions lead through the western part of Passamaquoddy Bay. St. Andrew Island and Port St. Andrew will be on the starboard bow, and the church spire and houses of the village of Robbinston will be nearly ahead. The land along the western shore slopes gradually, and is partly covered with a low growth of trees. When up to St. Andrew Island, **Lewis Cove**, a shallow cove in the western shore, and the village of **North Perry** will be passed. Just below Liberty Point is **Mill Cove**, a shallow cove, at the head of which is the village of **South Robbinston**. St. Croix River Lighthouse will be seen ahead in the middle of the river. The beacons marking the northern entrance into Port St. Andrew should be left well on the starboard hand when standing for the entrance of the river.

Dangers.—**Clark Ledge**, showing bare at half tide, and a small part showing near high water, lies about 225 yards from the wharf line of the northern part of Eastport, and about 500 yards **SE.** by **S.** from Dog Island; this ledge can be avoided by giving the western shore a berth of at least 350 yards.

A **ledge**, showing bare at low water near its end, makes out about 100 yards in a northeasterly direction from Dog Island.

Frost Ledge, showing bare in places near low water, lies about 450 yards **E.** from **Frost Island**, the small island at the southern point at entrance to Gleason Cove; there is a channel with 10 feet of water between the ledge and island. Off the eastern edge of the ledge is a buoy (spar, black, No. 1); in entering Gleason Cove this buoy should be left well on the port hand.

The western shore above Gleason Cove can be approached in many places as close as 200 yards, but it is advisable to give the shore a berth of at least 350 yards, keeping out of the coves until up to Mill Cove, where it should be given a berth of over 400 yards.

Shoals make southeastward from St. Andrew Island, and are marked at their southern and eastern ends by two buoys. The western shore of St. Andrew Island should be given a berth of at least 250 yards, and when passing the North West Beacon (about 700 yards **NW.** ½ **W.** from the northern point of the island) give it a berth of at least 300 yards.

2. ***From the Entrance (Liberty Point) to The Ledge.***—Having followed the directions in section 1, preceding, enter the river so as to pass about midway between Liberty Point on the west and Joes Point on the east; steer about **N.**, so as to be well over toward the eastern shore when 1½ miles below St. Croix River Lighthouse. Follow along the eastern shore, giving it a berth of from 250 to 700 yards, and keeping out of the bights. Give the eastern side of Dochet Island a berth of at least 450 yards.

When St. Croix River Lighthouse bears about *SW.* work over westward gradually, and follow a mid-river course, heading for the eastern side of Oak Point. When this point is about ⅜ mile distant ahead and the river is well opened westward, shape the course about **NW.** by **W.** so as to pass midway between Bluff Head on the starboard hand and Middle Ground buoy (spar, black, No. 5) on the port. Continue up the river, passing about 150 yards south of Spruce Point Lighthouse. After passing this lighthouse keep in the middle of the river until a **NNW.** ½ **W.** course can be steered, which will lead about 50 yards eastward of Elliott Flats buoy (spar, black, No. 7). When a short distance past this buoy, follow the northern shore and anchor off the village northeastward of the three wooden piers.

The best anchorage is off the ruined wharves on the northern shore, and vessels should anchor so as to swing clear of them when the tide turns.

Remarks.—On the **N.** course, Dochet Island and the lighthouse will be on the port bow. When about 1¼ miles below this island care should be taken not to be set over on the Middle Ground, which lies fair in the middle of the river, 1 mile below the island, and is marked at its southwestern end by a red spar buoy. **Johnson Cove**, a shallow bight, makes into the eastern shore abreast the Middle Ground; opposite, on the western shore, is the village of Red Beach.

Devils Head is the high hill, with bluff faces toward the river, which shows conspicuously when abreast the prominent white church spire in Robbinston. The river makes a sharp bend westward above Devils Head. **Oak Point** is the low point above Devils Head, separating St. Croix River from Oak Bay. Emptying into the eastern side of the entrance of Oak Bay is Warwig Creek. **Bluff Head**, on the north shore of St. Croix River ⅜ mile westward of Oak Point, has bluff perpendicular wooded faces; **Spruce Point Lighthouse**, a small, square, white structure, is about ½ mile above Bluff Head, and should be nearly ahead on the **NW.** by **W.** course.

The Ledge is about ¾ mile above Spruce Point Lighthouse. At the upper end of the village is **Mark Point Lighthouse**, a small, square, white structure. On the south side of the channel, about **SE.** from Mark Point Lighthouse, are three wooden piers, above which vessels should not go without a pilot.

Dangers.—A **ledge** with 17 to 19 feet of water over it lies about 600 yards westward from the eastern shore abreast Joes Point at the entrance to the river from Passamaquoddy Bay. Deep-draft vessels avoid this ledge by keeping in the middle of the entrance or favoring the western shore until about ¼ mile above Joes Point.

Middle Ground has 3 to 11 feet of water over it, is nearly ⅝ mile long, and lies in the middle of the river, the lower end being 1 mile **S.** by **E.** from Dochet Island. This shoal is marked by a buoy (spar, red, No. 0) at its southwestern end, and may be avoided by keeping well over toward the eastern shore of the river.

Little Dochet Island is a small rocky island lying between the Middle Ground and the western shore; a ledge with 2 feet of water at its end makes out 200 yards south from the island.

Half Tide Ledge is the southernmost of the extensive ledges which surround Dochet Island. It shows bare in spots at half tide, and its southwestern point is marked by a buoy (spar, red, No. 2).

An unmarked **ledge** with 2 to 5 feet of water over it makes out 300 yards eastward from Dochet Island abreast the lighthouse. A ledge extending a little over 250 yards north from Dochet Island shows partly bare at half tide; just northward of this ledge is a buoy (spar, red, No. 4).

Sandy Point Shoal is bare at low water, it extends 125 yards out from Sandy Point, the point lying about **NNE.** from Dochet Island. A short distance above Sandy Point a shoal, with 19 feet over it, lies 350 yards from the eastern shore; this shoal is not marked, but is avoided by keeping in midstream.

Shoals make southward from Oak Point for a distance of 400 yards; these shoals have a depth of 13 feet near the end and are marked by a buoy placed near the southwestern edge.

Shoals with 7 to 12 feet of water over them make out from the south shore of the river above Devils Head, leaving the channel, between the 18-foot curves, about 200 yards wide off Bluff Head. The northern edge of these shoals is marked by a buoy (spar, black, No. 5).

Opposite The Ledge, making off from the south shore of the river, are **large flats** which run dry at low water; they are known as Elliott Flats, and are marked at their northeastern edge by a buoy (spar, black, No. 7).

COAST FROM WEST QUODDY HEAD TO LITTLE RIVER.*

From West Quoddy Head to Little River, about 14 miles, the coast trends about **SW.** by **W.** ½ **W.**, and is for the most part high, rocky, covered with trees, and with precipitous faces seaward. It is quite bold-to, and

*Shown on charts **101**, scale $\frac{1}{80,000}$, price $0.50; **301**, **303**, scale $\frac{1}{40,000}$, price of each, $0.25.

the only outlying dangers are: **Morton Ledge**, with 6 feet of water over it, lying about ⅝ mile offshore, 2¼ miles **SW.** by **W.** ⅛ **W.** from West Quoddy Head Lighthouse, and marked by Morton Ledge buoy (nun, red, No. 2). There is a 13-foot spot ¼ mile **SW.** ½ **S.** from Long Point, about 2 miles eastward of Little River Lighthouse.

The shore is broken by the following unimportant coves, named from eastward with their distances in miles from West Quoddy Head Lighthouse: Carrying Place Cove, 1¼; Wallace Cove, 1¾; Hamilton Cove, 3; Julia Cove, 3¼; Boot Cove, 4; Baileys Mistake, 5½; Haycock Harbor, 6¼; Sandy Cove, 6½; Moose Cove, 7¾; Bog Brook, 9¼; Black Point Cove, 11¾; Long Point Cove, 12¼; and Schooner Brook, 13¾. The largest of these are Baileys Mistake and Moose Cove. When passing along outside, both of these will appear to be good open anchorages, but neither has good holding ground, nor can they be used as a harbor of refuge. Both have ledges, not buoyed, at their entrances, and afford shelter only from northerly winds. **Baileys Ledge** lies off the western side of the entrance to Baileys Mistake, and **Eastern Head Ledges** off the eastern side of the entrance to Moose Cove; both are dangerous and are unmarked except at low water.

LITTLE RIVER (CUTLER).*

This harbor is 14 miles westward of West Quoddy Head and about 9½ miles eastward of Libby Islands; it is marked by **Little River Lighthouse** (see table, page 16), which is situated at the western side of the entrance on Little River Island. It is a small but excellent harbor of refuge, sheltered from all winds, has 12 to 30 feet of water with good holding ground, and is used by coasters and fishermen. The channel leads northward of the lighthouse and has a depth of 6 fathoms. The harbor can be entered without the assistance of a pilot by closely following the directions. The usual anchorage is about ½ mile long and ¼ mile wide, just inside of Little River Island, but small vessels sometimes anchor well up toward the head of the harbor and lie aground at low water.

Cutler, the village at the head of the harbor, is of no commercial importance; it has telephone communication with Machias. There are several hotels and summer residences and a steamboat wharf at the village on the north side, and a church with cupola is prominent at the head of the harbor. It is a rendezvous for pilots for ports eastward and the British Provinces. Pilots can usually be found here to take vessels westward.

For **tides** see table, page 27.

Ice.—The harbor is never obstructed by ice so as to prevent vessels entering.

SAILING DIRECTIONS, LITTLE RIVER.

1. ***From Eastward.***—Bring Little River Lighthouse to bear **W.** and steer for it, keeping it on that bearing until about ¼ mile from the lighthouse; then steer about **NW.** by **W.** ½ **W.** so as to pass about 250 yards northward of it. Leave Little River Ledge buoy (spar, red, No. 2) on the starboard hand. Anchor in 12 to 30 feet of water anywhere northwestward of the island, but not closer than 150 yards from the shore.

Remarks.—The shore between West Quoddy Head and Little River entrance may be approached anywhere to ½ mile, and closer in many places. The white pyramidal fog-bell structure southward of Little River Lighthouse is the most conspicuous feature to recognize the entrance.

The eastern and northern shores of Little River Island should not be approached closer than 150 yards. Westward of the island there is a passage with 9 feet of water, but it is narrow and rocky, and strangers should not attempt to use it.

Dangers.—There are no outlying dangers in coming along shore from eastward until near Long Point; a little over ¼ mile **SW.** ½ **S.** from this point there is a shoal spot with 13 feet over it and 11 fathoms to the northward.

Little River Ledge, showing bare in places at low water, and marked by Little River Ledge buoy (spar, red, No. 2), makes out from the northern shore of the entrance.

1 A. ***From Westward.***—In approaching from westward Little River Lighthouse will not be seen until it bears nearly *N.* and is clear of Little River Head. Give the shore westward of the entrance a berth of ½ mile. When Little River Lighthouse

*Shown on chart 303, scale $\frac{1}{40,000}$, price $0.25.

is opened haul up so as to leave Little River Head a little more than ¼ mile on the port hand; bring the lighthouse to bear about *NW.* and stand in. Pass 250 to 300 yards eastward of it, and when the lighthouse bears **SSW.**, distant about 300 yards, haul westward and follow the directions in section 1.

See remarks and dangers under section 1.

LITTLE MACHIAS BAY.*

Little Machias bay, about 2½ miles westward of Little River (Cutler Harbor), is not used for an anchorage as it is exposed to southerly and southeasterly winds, and is close to Little River and Machias Bay, both excellent anchorages. The entrance to the bay lies between **Deer Island** on the east and **Cape Wash** on the west, and is about 1¼ miles in width. The shores are mostly barren and rocky; the eastern and northern are dotted with houses, but the western shore is very thinly settled. The best anchorage is on the western side of the bay in from 2 to 5 fathoms of water, about ½ mile above Dennisons Point; above this the bay is much obstructed by rocky ledges and shoals which extend to its northern end.

Westward of Little Machias Bay is **Cross Island Narrows**, a narrow passage into Machias Bay, separating Cross Island from the mainland; it is much obstructed by rocks and shoals, and, although some of the dangers are marked, strangers should not attempt to use it.

Old Man, a small but prominent rocky isle lying about 1 mile **SE. ½ S.** from Cape Wash, is a good landmark passing along the coast and may be approached in deep water as close as 400 yards on all sides.

Deer Island is a small rocky isle on the eastern side of the entrance, about 150 yards from the mainland and ⅜ mile **SE.** from Dennisons Point. **Cape Wash Island**, small and rocky, lies **SE.** from Cape Wash and is separated from it by a channel about 200 yards wide.

The **Black Ledges** are rocky spots, bare at all stages of the tide, lying midway between Deer and Cape Wash islands; there is good water close-to on both sides.

As Little Machias Bay is so little used as an anchorage no sailing directions are given.

MACHIAS BAY AND RIVER.†

This bay is easily entered, and affords well-sheltered anchorage for the largest vessels; it is about 6 miles long in a **NNE.** and **SSW.** direction, and the main entrance between Cross Island on the east and Stone Island on the west is a little over 2 miles wide. The dangers are well marked and the channel is straight, so that any vessel can enter with the assistance of the chart or by close attention to the directions. The principal guide to the entrance is **Libby Islands Lighthouse** (see table, page 16), which is 9 miles westward of Little River Lighthouse and 9 miles **ENE. ½ E.** from Moose Peak Lighthouse. **Avery Rock Lighthouse** is 5¼ miles **NNE. ⅝ E.** from Libby Island Lighthouse, and the guide for vessels bound up the bay.

The **anchorage** in Machias Bay is more easily made in thick weather than any other in this vicinity. Vessels standing along the coast will usually hear the fog signal on Libby Islands a distance of 3 miles or more, and when standing up the bay the bell on Avery Rock should be heard about 2 miles. It should be remembered that the sound from these signals is subject to aberration, but not to so marked a degree as from the signal at Petit Manan.

Machias River empties into the northwestern part of the bay; it has a narrow, winding channel, marked by buoys at the turns, leading through flats which are mostly bare at low water. The least water in the channel up to the town of Machiasport is 19 feet; this depth is decreasing. A little below the town of Machias it shoals to 4 and 5 feet at low water. Machias is at the head of navigation, and about 6½ miles above the mouth of the river. Although the river is buoyed as far as Machiasport, it is advisable for strangers to take a pilot or towboat.

East Machias River is a narrow, shallow stream empyting into the Machias River from northward, a short distance above Machiasport.

Cross Island Narrows is a channel leading into Machias Bay, east of Cross Island; this passage, much obstructed by rocks and ledges, should never be attempted by a stranger.

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*Shown on chart **303**, scale $\frac{1}{40,000}$, price $0.25.

†Shown on charts **102**, scale $\frac{1}{80,000}$, price $0.50; **303**, and in part on **304**, scale $\frac{1}{40,000}$, price of each $0.25.

North West Harbor, a bight in the north shore of Cross Island near its western end, has from 4 to 9 fathoms of water, but is little used as an anchorage.

Fosters Channel is a narrow passage, marked by two buoys, leading from Englishman Bay to the western entrance of Machias Bay, between Fosters Island and Ram Island. It is seldom used by any vessels but those acquainted with the locality.

Starboard Cove, on the western side of the bay north of Starboard Island, is an excellent anchorage with 15 to 24 feet of water, and is much frequented by coasting vessels making an anchorage for the night if bound through Moosabec Reach. A bar, dry at low water, connects Starboard Island with the mainland; the anchorage is made by rounding the eastern end of the island.

Howards Bay, northward of Starboard Cove is not a good anchorage; the holding ground is very poor.

Bucks Harbor is a small shallow cove in the west shore of the bay, about west from Yellow Island; a small village of the same name is located on the shore of this harbor. Fishermen and small craft are the only vessels that enter for an anchorage.

Larrabees Cove, largely dry at low water, and **Indian Cove** are two small coves in the west shore of the bay, northwest from Avery Rock Lighthouse; these coves are of no importance, but good anchorage for vessels of 8 feet draft will be found on the flats between Salt Island and Bare Island, near their entrances.

Holmes Bay, a large bight in the northeastern part of Machias Bay and east of Hog Island, is so shallow that it can not be used as an anchorage.

Machiasport is on the west bank of the river, about 2¾ miles above its entrance; it has telephonic communication with Machias. Vessels of 18 feet draft have been taken up to the town, but the usual draft is 11 feet. There is 6 to 7 feet of water alongside the wharves, which, in 1902, were in poor condition.

East Machias is a village about 2½ miles above Machiasport on the East Machias River. The deepest draft entering here is 12 feet.

Machias is a town about 3¾ miles above Machiasport on the Machias River. The deepest draft going to Machias is 14 feet; it has railroad and telegraphic communication, and ships considerable lumber in small coasting vessels.

The **channels** leading into Machias Bay on the east and west sides of Libby Islands are clear and unobstructed; the eastern, between Cross Island and Libby Islands, is about 1½ miles wide and has a least depth of 15 fathoms; the western, between Libby Islands and Ram Island, is about ¾ mile wide and has a least depth of about 21 fathoms. Above the Libby Islands the channel leads straight for Avery Rock, passing it on either side; the least depth to this point is 8 fathoms. Above the rock the channel leads **NNE.**, passing close to the islands off the western shore; abreast of Round Island it is a little over ½ mile wide with a depth of 5 to 7½ fathoms. Above Round Island the water shoals, and a stranger should anchor.

Anchorages.—The principal anchorages are: Starboard Cove, in 15 to 24 feet of water; and northeastward and eastward of Round Island in 4½ to 7 fathoms. Vessels of less than 12 feet draft sometimes anchor 1 mile **NNE. ¾ E.** from Round Island, in 14 to 18 feet, soft bottom. Good anchorage will be found between Round Island and Avery Rock, in 5 to 7 fathoms.

Pilots are not necessary for the bay, but a stranger entering to go up the Machias River should take either a pilot or a towboat. The pilot signal should be made when inside of Libby Islands; if they do not board the vessel in the lower bay they will be sure to do so when abreast of Bucks Harbor.

Towboats.—Vessels requiring a tug should take one off Round Island. If not found there, they will come from Machiasport when ordered.

Supplies.—Provisions and some ship-chandler's stores can be obtained at Machias.

Repairs.—There is a shipyard at Machias and at East Machias where wooden vessels are built.

Storm warning displays of the United States Weather Bureau are made at Machiasport.

Marine Hospital.—Relief is furnished by an Acting Assistant Surgeon of the United States Public Health and Marine-Hospital Service at Machias.

Ice.—In severe winters Machias River is closed to navigation, and drift ice will sometimes fill the bay above Avery Rock. In ordinary winters the bay and river are open to Machiasport.

The currents follow the general direction of the channel and are not strong except in the river.

For **tides** see table, page 27.

SAILING DIRECTIONS, MACHIAS BAY.

Machias Bay may be entered from eastward through Cross Island Narrows, but strangers should not attempt it.

1. ***Approaching and Entering, from Eastward.***—*I. Vessels of 20 feet or less draft.*—With Libby Islands Lighthouse on any bearing northward of *W.*, steer for it, and when 2 miles from the lighthouse shape the course so as to pass about ½ mile eastward of the northern end of Libby Islands. Bring Avery Rock Lighthouse to bear **N.** by **E.** ¼ **E.** and steer for it, keeping it on that bearing; leave it about 200 yards on either hand and head for the eastern end of Round Island. Anchor anywhere between Avery Rock and Round Island, or just northeastward of the latter.

II. Vessels of over 20 feet draft.—Follow the directions in the preceding paragraph until abreast of Yellow Island and Avery Rock Lighthouse is about ⅝ mile distant ahead, then haul a little more northward and steer so as to leave Avery Rock about 350 yards on the starboard hand; when the lighthouse is abeam steer **N.** by **E.** for the eastern end of Round Island and when about 400 yards from the island steer **NE.** and anchor with Round Island bearing *W.* distant 550 yards; the depths at this anchorage range from 5 to 7 fathoms.

III. At night.—Follow the directions in paragraph 1, preceding, and bring Avery Rock Light on a **N.** by **E.** ¼ **E.** bearing as soon as it is sighted; then stand for the light on that bearing and follow the directions in paragraph II, preceding.

Bound up the Machias River.—Strangers are advised to take a pilot or towboat; if without either, the best time to go up the river is at low water, when the flats are bare and the edge of the channel fairly well defined.

To make an anchorage in Starboard Cove.—Bring the northeastern end of Libby Islands to bears *WSW.*, distant ½ mile, and steer about **NNW.** ½ **W.**; pass about ¼ mile northward of Stone Island and southward of black can buoy No. ½, and then change the course to **NW.** by **W.** ½ **W.** so as to pass about ¼ mile northward of Starboard Island. Anchor in 15 to 24 feet of water as soon as the north end of Starboard Island and the south end of Stone Island come in range. The water shoals gradually southward toward the bar connecting Starboard Island with the mainland.

Remarks.—There are no dangers in approaching from eastward. Libby Islands are bold-to and may be approached as close as 300 yards, except on their southeastern side, where they should be given a berth of ¼ mile.

On the **N.** by **E.** ¼ **E.** course, **Chance Island** (round, moderately high and wooded, except its western end) will be on the starboard bow and **Yellow Island** (small, with bare, light-colored rocky bluff at south end) on the port bow. As Avery Rock is approached, **Round Island** will be seen 1 mile **N.** of it and **Salt Island** just westward of Round Island.

On the **NNW.** ¼ **W.** course for Starboard Cove, **Stone Island,** rocky, covered with a thick growth of small fir, will be on the port bow. A black iron spindle, with a cage on top, marking Stone Island Ledge, will be seen eastward of Stone Island. A black can buoy lies about ¼ mile **NE.** by **N.** from the northern end of Stone Island; this buoy should be made nearly ahead. As Stone Island is approached, **Starboard Island,** distinguishable by a high, bare, precipitous face, will be opened out to the westward.

Dangers.—**Cross Island Ledge** makes out nearly ¼ mile westward from the southwest end of Cross Island. A buoy (nun, red, No. 2) lies about ¼ mile **SSW.** from this ledge and should be left well on the starboard hand in entering the bay.

Sea Shore Ledge, partly bare at low water, is marked by a buoy (spar, black, No. 1), and lies in the western side of the bay, about ¼ mile in a southeasterly direction from Howard Point.

Yellow Island and Chance Island are quite bold-to on the channel side, but a ledge extends about 300 yards southward from the southern end of Chance Island.

Shoals make out ¼ to ½ mile westward from Sprague Neck, leaving the channel eastward of Avery Rock a little less than ½ mile in width.

1A. ***Approaching and Entering, from Westward.***—With Libby Islands Lighthouse on any bearing northward of **E.** by **N.**, steer for it, and when within 2 miles of the lighthouse shape the course so as to pass ½ mile westward of it. When the lighthouse bears *E.*, distant about ½ mile, steer **NE.** until Avery Rock Lighthouse bears **N.** by **E.** ¼ **E.**, then steer for the latter, keeping it on that bearing, and follow the directions given in section 1, paragraphs I or II, according to draft.

To an anchorage in Starboard Cove, proceed as directed above, until the spindle on Stone Island Ledge is ⅜ mile distant on the port beam, then steer about **N.** for the black can buoy northward of Stone Island, and when up to the buoy change course to **NW.** by **W.** ½ **W.**, passing about ¼ mile northward of Stone and Starboard islands; then anchor as directed in section 1, foregoing.

Or, desiring to pass between Starboard Island and Stone Island, when Libby Islands Lighthouse bears *E.*, distant ½ to ¾ mile, steer **NNE.** ½ **E.** for the southern end of Stone Island; when about ¼ mile from the island and Starboard Island Ledge buoy (spar, red and black horizontal stripes) bears *WSW.*, steer **N.** ¾ **W.** for the north end of Starboard Island, leaving Stone Island about 300 to 400 yards on the starboard hand. Round the northern end of Starboard Island at a distance of about 300 yards; haul westward and anchor as directed in section 1, foregoing.

Vessels bound into Starboard Cove may pass about ¼ mile eastward of Ram Island and then head **NNE.** for the northeastern end of Starboard Island. Leave Starboard Island Ledge buoy 350 yards on the starboard hand, and give the eastern shore of Starboard Island a berth of 350 yards.

Remarks.—The **NE.** course into the bay leads about midway between Libby and Stone islands; Starboard Island Ledge buoy is left ⅛ mile, and Stone Island Ledge spindle ⅜ mile, on the port hand. Chance Island will be on the port bow. (See also the remarks under section 1, preceding.)

On the **NNE.** ½ **E.** course, heading for the southern end of Stone Island, Starboard Island Ledge buoy should be left at least 350 yards on the port hand. The western shore of Stone Island and eastern shore of Starboard Island should be given a berth of at least 300 yards.

On the **NNE.** course, passing between Fosters Island and Starboard Island Ledge, care must be taken to give the eastern shore of Fosters Island a berth of over 400 yards to clear a ledge which makes off from the island for this distance.

Dangers.—**Scabby Islands,** lying ½ mile westward of Ram Island, have ledges extending southward and should not be approached on their southern side closer than ¼ mile.

Ram Island, a low rocky isle with scanty growth of stunted fir trees on its western end, lies 1¼ miles **NW.** ¾ **W.** from Libby Islands Lighthouse; it has shoals making out about 200 yards from its eastern edge.

Starboard Island Ledge, with 7 to 18 feet over it, and lying ⅜ mile **SW.** ½ **W.** from the southern end of Stone Island, is marked by a buoy (spar, red and black horizontal stripes).

The shoals making out from the southern end of Fosters Island, at the entrance to Fosters Channel, are marked by a buoy (spar, red, No. 2). The eastern side of Fosters Island has shoals making out about 400 yards and should not be approached nearer than ¼ mile.

A **ledge** makes off 400 yards northward from Ram Island and is marked at its northern end by a buoy (spar, black, No. 1). Fosters Channel leads between this buoy and the red spar buoy marking the ledge south of Fosters Island.

Stone Island Ledge, showing bare at low water and marked by a spindle, lies 320 yards eastward of the Island, and nearly midway along its length. An 8-foot spot lies nearly 300 yards **SW.** by **W.** from the spindle.

LITTLE KENNEBEC BAY*

is an anchorage westward of Machias Bay and makes northward from the eastern part of Englishman Bay; it is of no commercial importance, and is frequented mostly by fishermen. There is good anchorage in 12 to 40 feet of water, soft bottom, and well sheltered, inside of Sea Wall Point, but it is seldom used, being so near Machias Bay and Starboard Cove, which are much easier of access and better anchorages. The **tides** are practically the same as at Starboard Island, Machias Bay (see table, page 27).

SAILING DIRECTIONS, LITTLE KENNEBEC BAY.

1. ***Entering from Eastward by Fosters Channel.***—This channel may be used, when the buoys can be seen, by vessels drawing not over 15 feet.

Bring Libby Islands Lighthouse to bear *SE.* ¾ *S.*, distant about 1 mile, and steer **NW.** ¾ **N.** Or, bring the north end of Libby Islands to bear *E.* ¾ *S.* and steer **W.** ¾ **N.** When nearly

*Shown on charts **102**, scale $\frac{1}{80,000}$, price $0.50; **303, 304**, scale $\frac{1}{40,000}$, price of each $0.25.

up to Foster Island Point buoy (spar, red, No. 2), steer so as to leave it 60 yards on the starboard hand and so as to pass 40 yards northward of Ram Island buoy (spar, black, No. 1). When the latter buoy bears about *SE.*, distant 200 yards, steer **NNW. ½ W.** and pass about 400 yards eastward of the dry part of Shag Ledge—the small, low islet surrounded by bare ledges at low water—which will be seen on the port bow. Continue the **NNW. ½ W.** course, passing about 350 yards eastward of Hickey Island, the next island northward of Shag Ledge. When the northern end of Hickey Island bears about *SW.* steer about **NNE.**, giving the eastern shore a berth of about 400 yards. Follow the eastern shore at this distance, keeping out of the bights, and when nearly up to Hope Island—small island off the western shore about 1¼ miles above the entrance—anchor in the channel in 3½ to 7 fathoms of water. Strangers should not attempt to go above Hope Island without a pilot.

Having come through Fosters Channel, bound into Englishman Bay.—When northward of Ram Island buoy (spar, black, No. 1), steer about **W.** by **N.** for the northern end of Halifax Island. When the eastern end of The Brothers bears abeam, steer **NW. ⅝ N.** for Shoppee Island, and, when nearly to the island, follow the directions for Englishman Bay.

Vessels may enter between Scabby Island and Ram Island, passing about midway between them, and when abreast of Ram Island buoy follow the directions in the preceding paragraphs.

Remarks and dangers.—The directions, if closely followed, will lead clear of dangers, but it is advisable for strangers bound up the bay to take a pilot.

On the **W. ¾ N.** course, Starboard Island Ledge buoy (spar, red and black horizontal stripes), marking the southern edge of Starboard Island Ledge, should be left nearly ¼ mile on the starboard hand. *Foster Island Point buoy* (spar, red, No. 2), marking the ledge off the southern end of Fosters Island, should be left about 60 yards on the starboard hand. *Ram Island buoy* (spar, black, No. 1) marks the northern end of a ledge making out from Ram Island, and should be left about 40 yards on the port hand.

On the **NNW. ½ W.** course care must be taken to avoid Shag Ledge, which extends 300 yards in an **ENE.** direction from its dry part. When this part of the ledge bears about **SW.** the vessel may be hauled more westward so as to insure clearing Pierson Ledge; but the eastern side of Hickey Island should not be approached closer than 400 yards. The eastern shore above Pierson Ledge is comparatively bold and free from dangers until up to Fan Island.

Pierson Ledge, bare at low water, lies about 300 yards from the eastern shore and a little over ¼ mile **NNE.** from the northeastern end of Shag Ledge.

On the **NNE.** course **Fan Island** (small island on the western side of the entrance to the bay) will be left 300 yards on the port hand. **Sea Wall Point**, the first point on the port hand above Fan Island, has ledges and shoal water extending 300 yards eastward from it.

1 A. ***Entering from Westward.***—Follow the directions in section 1 A, paragraph II, for entering Englishman Bay. When the north end of Halifax Island bears *WNW.*, distant ⅝ mile, steer about **N.** by **E.**, and when the northern end of Hickey Island bears *ENE.* steer **NE. ¾ E.** Pass about 400 yards northward of Hickey Island and about 300 yards southward and eastward of Fan Island, and then follow the eastern shore, giving it a berth of 400 yards, and anchor as directed in section 1.

See remarks and dangers under section 1, foregoing, and under section 1, "Sailing Directions, Englishman Bay."

ENGLISHMAN BAY, ROQUE ISLAND HARBOR, CHANDLER BAY, AND CHANDLER RIVER.*

These waters lie northward, between Libby Islands and Head Harbor Island, forming a large bight, with Roque Island in the middle and numerous smaller islands off the entrance. Englishman Bay and Chandler Bay are the approach to Chandler River, Roque Island separating the bays at their southern parts; above Roque Island they unite and form an excellent anchorage with 3½ to 6 fathoms of water, good holding ground.

* Shown on charts **102**, scale $\frac{1}{80,000}$, price $0.50; **304**, scale $\frac{1}{40,000}$, price $0.25.

Englishman Bay, eastward of Roque Island, is of little importance except as an approach to Chandler River and Jonesboro. There are numerous unmarked dangers in the bay before reaching the anchorage, and strangers with a sailing vessel should not attempt to enter except with a fair wind. The principal entrance to the bay from eastward is between Scabby Islands on the east and The Brothers on the west, and affords a straight course to Shoppee Island, which is below the anchorage. It may be entered from Machias Bay through Fosters Channel, but special care should be taken by strangers when using this passage. Vessels from westward, bound to the anchorage at the head of Englishman Bay or to Chandler River, usually pass through Chandler Bay, the channel of which is buoyed and readily followed in the daytime in clear weather.

Roque Island Harbor includes the large bight in the southern side of Roque Island, and the water immediately northward of several islands extending eastward from Roque Island; the westernmost and largest of these islands is **Great Spruce Island,** and the easternmost **Halifax Island.** This harbor affords good shelter from all winds, but it is only used by fishermen and small vessels well acquainted with the locality; the holding ground is not good except in spots, and strangers are advised not to anchor in it. The passages into the harbor from southward, between the islands, are more or less obstructed by ledges; the westernmost, between Great Spruce Island and Double Shot Island, has two spots with 15 and 17 feet, respectively, over them, but is otherwise clear and easy to enter. The usual and best entrance is from eastward passing north of Halifax Island. There are several ledges inside the harbor which are not marked.

Chandler Bay is on the west side of Roque Island, and extends northward from Mark Island to **Squires Point,** the northwestern point of Roque Island, where it joins Englishman Bay. A good channel leads eastward of Ballast Island and around Squires Point into Englishman Bay and Chandler River. The principal dangers in this channel are buoyed, and it can be readily followed in the daytime in clear weather. This bay is the approach from westward to Chandler River and the anchorage in Englishman Bay, and the one generally used by strangers. There is no anchorage in the bay until north of Roque Island. Vessels of 21 feet draft can safely pass up the bay, but the anchorage for vessels of this draft is limited to ¼ mile square or less.

Shorey Cove is a bight, with 8 to 13 feet of water, in the north shore of Roque Island; it is a good anchorage for small vessels but is little used. **Pond Cove,** northeastward of **Great Head,** the northeastern point of Roque Island, has excellent anchorage in 12 to 18 feet of water, but is much obstructed by fish weirs. **Masons Bay,** a shallow, unimportant body of water, makes westward on the western side of the mouth of Chandler River.

Chandler River empties into the head of Englishman Bay; the entrance is between Nepp Point on the east and Look Head on the west, and is about 400 yards wide. The river a little above the entrance widens and then again contracts, and is very narrow and crooked to Jonesboro, the head of navigation, about 3½ miles above its mouth. Strangers should not attempt to enter without a pilot.

Jonesboro is a village on the north bank; vessels of 10 feet draft go up to it at high water; 12 feet is the deepest draft entering the river.

Supplies.—Provisions can be obtained in Jonesboro.

Ice closes the river to its mouth from December to April.

The **tides** are practically the same as at Starboard Island, Machias Bay. (See table, page 27.)

SAILING DIRECTIONS, ENGLISHMAN BAY, TO AN ANCHORAGE NORTH OF ROQUE ISLAND.

The following directions are good for a draft of 17 feet or less:

1. ***Approaching and Entering, from Eastward.***—When Libby Islands Lighthouse is sighted steer so as to pass ½ to ¾ mile southward of it, and when it bears *N.*, distant ½ to ¾ mile, steer about **WNW.** ½ **W.** for the eastern end of The Brothers. When about ¾ mile from The Brothers, and the southern end of Scabby Island bears about *NE.*, distant ⅝ mile, change the course to **NW.** by **N.** for Shoppee Island. Keep this island on the bearing until nearly up to it, then haul westward so as to leave it about 300 yards on the starboard hand. When abreast the northern end of Shoppee Island steer about **WNW.** and anchor northward of Roque Island in 3¼ to 6 fathoms of water.

Or, if of less than 10 feet draft, when abreast the northern end of Shoppee Island, steer about **N.** by **W.** ½ **W.** and anchor in 12 to 14 feet of water, not more than ½ mile westward or northwestward of Pond Cove Island. Vessels of 8 feet or less draft may anchor in Pond Cove northward of Pond Cove Island, but it is much obstructed by fish weirs.

The bay may be entered from eastward through Fosters Channel. (See sailing directions for Little Kennebec Bay, page 51.)

Destring to enter Roque Island Harbor.—This is not a good anchorage, and is seldom used except by light-draft vessels with local knowledge. On the **NW.** by **N.** course up Englishman Bay, when about ½ mile northward of Halifax Island, change the course to about **WSW.** and stand in, keeping near the middle of the harbor. The bottom is hard and rocky except in the northern and northwestern parts, where soft bottom will be found.

Remarks.—**The Brothers,** when seen from eastward, will appear as one island. On the **NW.** by **N.** course The Brothers buoy (bell, black) and Green Ledge buoy (spar, red, No. 4) will be left about ¼ mile on the port hand. **Halifax Island,** low, with thin growth of scrub firs on its eastern end, will be left about ¼ mile on the port hand. **Cow Point,** a thickly wooded point, will appear on the starboard bow, and **Shoppee Island,** flat with straggling trees, will be ahead and showing to the left of the houses on Shoppee Point. The houses of a small village will be seen as the bight between Cow Point and Shoppee Island is opened.

Dangers.—There are no outlying dangers from eastward until abreast **Scabby Island Ledge,** which is bare at low water, and lies about 250 yards southwestward of Scabby Island; it is unmarked, but may be avoided by giving the southern end of Scabby Island a berth of at least ¼ mile.

There are a succession of **unmarked shoal spots,** with from 10 to 16 feet of water over them, making northward from Halifax Island to Great Head, lying about ½ mile off the northeast side of Roque Island; they will be left from ¼ to ½ mile on the port hand if the **NW.** by **N.** course is made good. A ledge with 7 to 11 feet over it makes out nearly 600 yards northward from the north side of Halifax Island. The channel into Roque Island Harbor passes between these spots.

Cod Head Ledge, a small rocky spot, covered at high water, lies 1⅛ miles **ENE.** ½ **E.** from the northeastern point of Halifax Island. It is unmarked, but will be left about ¼ mile on the starboard hand when on the **NW.** by **N.** course.

Shoals and ledges make off over ½ mile eastward from Roque Island, leaving the channel abreast Shoppee Island about 600 yards wide.

1 A. ***Approaching and Entering, from Westward.***—***I. To enter between The Brothers and Scabby Island.***—Shape the course so as to pass 2 miles southward of Moose Peak Lighthouse, and when it bears *NNW.* head about **NE.** ¼ **E.** for Scabby Island. When the northern edge of The Brothers bears *WNW.* ½ *W.*, distant about ¾ mile, steer **NW.** by **N.** for Shoppee Island; keep it on that bearing, and follow the directions in section 1, foregoing.

II. To pass between Green Ledges and Halifax Island.—When close to the whistling buoy, with Moose Peak Lighthouse bearing *NNW.*, distant 2 miles, steer **NE.** ½ **N.** for the western end of The Brothers, and keep a sharp lookout for Jumpers Ledge buoy (nun, red and black horizontal stripes). When about ¾ mile from The Brothers and Pulpit Rock bears *NNW.* ¾ *W.*, steer **N.** by **E.** ¼ **E.** for the eastern end of Halifax Island. When about ¾ mile from Halifax Island, with Green Island bearing *E.*, change the course to **NE.**, and when the northern end of Halifax Island bears *WNW.*, distant about ⅝ mile, steer **NW.** by **N.** for Shoppee Island; then follow the directions in section 1, foregoing.

III. Coming from Moosabec Reach.—Leave the black can buoy marking Gilchrist Rock about 75 yards on the starboard hand and steer **E.** ¼ **N.**, heading for Pulpit Rock; as the latter is approached leave it 250 yards on the starboard hand, and when it is passed bring the rock to bear *SW.* by *W.* ¼ *W.* over the stern, and steer **NE.** by **E.** ¼ **E.** Take care to leave Halifax Island over ¼ mile on the port hand, and when the eastern end of The Brothers bears *S.* ½ *E.*, steer **NW.** by **N.**, heading for Shoppee Island. Then follow the directions in the first paragraph of section 1, preceding.

Remarks.—The red whistling buoy, lying 2 miles **SSE.** from Moose Peak Lighthouse, will be passed close aboard.

On the **NE.** ½ **N.** course Green Island will appear a little open northward of The Brothers; Libby Islands Lighthouse will be broad on the starboard bow and Pulpit Rock on the port bow. Jumpers Ledge buoy will be left nearly ½ mile on the port hand. The passage between Green Island Ledge and Halifax Island should not be used by vessels of over 16 feet draft, as there is a shoal spot with 21 feet over it midway between Halifax Island and Green Ledges.

On the **NE.** course Hickey Island will be ahead.

Dangers.—**Jumpers Ledge,** a small and rocky spot, with 5 feet over it and showing kelp at extreme low water, is marked by a buoy (nun, red and black horizontal stripes). It lies a little over 1 mile **WSW.** from the western end of The Brothers. A 16-foot spot lies nearly 200 yards northeastward from this buoy.

Pulpit Rock, a bare, rocky islet (rookery for sea birds), lies 1 mile **WNW. ¾ W.** from the western end of The Brothers. It is surrounded by deep water.

Green Island, bare, rocky islet, and **Green Island Ledge**, which extends eastward from the island and is connected at half tide, lie northward of and are separated from The Brothers by a buoyed channel known as Brothers Passage.

The southern edge of Halifax Island should not be approached nearer than ¼ mile so as to avoid small rocky spots, bare at half tide, making out from the southeast end of the island. The islands westward of Halifax Island should be given a berth of over ¼ mile.

See also dangers, under section 1, foregoing.

SAILING DIRECTIONS, CHANDLER BAY, TO AN ANCHORAGE NORTH OF ROQUE ISLAND.

The following directions are good for a draft of 18 feet.

1. ***Approaching and Entering, from Eastward.***—When Libby Islands Lighthouse is made, shape the course so as to pass ¾ mile southward of it, and when it bears *N.* steer **W.** by **N.**, leaving The Brothers and Pulpit Rock about ¼ mile on the starboard hand, and Jumpers Ledge buoy (nun, red and black horizontal stripes) ¼ mile on the port hand. When the eastern end of Mark Island bears *SSW.*, distant ½ to ¾ mile, change the course to **N. ½ W.**, and pass midway between the buoy on Ballast Island Ledge and Roque Island. When Squires Point, the northwest point of Roque Island, bears about *E.* by *N.*, and the red spar buoy on Roque Island Ledge is about 250 yards distant and about 2 points abaft the starboard beam, steer **NE.** by **E.**; pass between Great Bar buoy (spar, black, No. 7) and Squires Point, leaving the buoy from 200 to 300 yards on the port hand; then haul eastward and anchor northward of Roque Island in from 3½ to 6 fathoms of water.

Or, wishing to anchor in Pond Cove.—When Squires Point bears *S.*, shape the course about **NE.** by **E. ½ E.** so as to pass 300 to 400 yards eastward of Little Ram Island. When the island bears *NW.*, steer about **NE.** into the cove, and anchor in 14 to 16 feet water, soft bottom.

If bound up Chandler River take a pilot.

Remarks.—On the **W.** by **N.** course **The Brothers**, bare and rocky, will appear as one island, until they are nearly abeam, and should be left at least ¼ mile on the starboard hand to avoid the rocky spot southwestward of them. **Pulpit Rock**, prominent, bare, rocky isle, will be a little on the starboard bow, and **Mark Island**, high, dark, with bluff rocky faces, will show very prominently a little on the port bow. The course leads about midway between Pulpit Rock and Jumpers Ledge buoy (nun, red and black horizontal stripes) and ¼ mile southward of Great Spruce and Little Spruce islands, and well clear of all dangers making out from them.

On the **N. ½ W.** course **Ballast Island**, bare of trees, and grassy, will show on the port bow, and **Parkers Head**, on the western side of Roque Island, will show as a high bluff, thickly wooded. Ballast Island Ledge buoy (spar, black, No. 5) should be left about ¼ mile on the port hand and Roque Island Reef buoy (spar, red, No. 2) ⅛ mile on the starboard hand. The western side of Roque Island is quite bold-to and may be approached as close as 300 to 400 yards except off Roque Island Ledge (see dangers).

There is a passage westward of Ballast Island, but it is somewhat obstructed by shoals and rocks and is seldom used.

Dangers.—**Jumpers Ledge**, a small ledge with 5 feet of water over it, lying ⅝ mile **S. ¼ W.** from Pulpit Rock, is marked by a buoy (nun, red and black horizontal stripes). This ledge shows a break near low water and kelp at extreme low tides.

Pulpit Rock, lying about 1 mile **WNW. ¾ W.** from The Brothers, is prominent and may be easily avoided.

A **dangerous unmarked rock**, which is either bare or on which the sea breaks at high water, lies nearly 1¼ miles **SW.** by **W. ½ W.** from Pulpit Rock.

Eastern Ledges, unmarked, but bare in one place near low water, lie about 2 miles **WSW.** from Pulpit Rock, and 1¼ miles **ESE. ½ E.** from the eastern end of Mark Island; the highest part of the ledge is covered at half tide. When any sea is running these ledges are marked by breakers.

Roque Island Ledge, making out ¼ mile northwestward from Squires Point, is marked at its western end by Roque Island Reef buoy (spar, red, No. 2).

Great Bar is an extensive shoal, partly bare at low water, making out from the mainland to the edge of the channel north of Squires Point. Its southeastern edge is marked by a buoy (spar, black, No. 7).

1 A. ***Approaching and Entering, from Westward.***—When Moose Peak Lighthouse is made, shape the course so as to pass 2 miles south of it, and when it bears *NNW.* steer **NNE.** so as to pass ½ mile eastward of Black Head. When the eastern end of Mark Island bears **NW.** change course and steer for it, keeping it on that bearing. When ½ mile from Mark Island change course to **N. ½ W.**, passing about ¼ mile eastward of it, heading so as to pass nearly ½ mile eastward of Ballast Island; then follow the directions in section 1, foregoing.

Remarks.—The **NNE.** course from the whistling buoy leads ¼ mile eastward of **Black Head,** the southeastern end of Head Harbor Island, whose dark, bare, steep rocks will show prominently on the port bow.

Mark Island, high, and thickly wooded, is prominent and easily picked up.

Dangers.—**Black Ledge,** marked by black spar buoy No. 1, is a dangerous, rocky spot, bare at low water about ¼ mile eastward of Head Harbor Island and ⅝ mile northward of Black Head. It should be approached with caution, as the buoy marking it is liable to get out of position, and it is so bold to that the lead gives no warning of danger.

Breaking Ledge is a 9-foot rocky spot ⅜ mile **NE.** from Black Ledge. It is unmarked, but the sea breaks on it except in very smooth weather.

Eastern Ledges and the other dangers are described under "Dangers," section 1, foregoing.

COAST BETWEEN CHANDLER BAY AND PLEASANT BAY.*

Lying between Chandler Bay and Pleasant Bay and extending about 5 miles southward from Moosabec Reach is a group of islands, which, though of no commercial importance, form several prominent landmarks for vessels passing along the coast. The passages between these islands lead to several small and sheltered anchorages, which are not available for strangers on account of numerous unmarked rocks and ledges. Fishermen frequent this locality and sometimes anchor for shelter in Head Harbor, Mistake Harbor, or Mud Hole.

Head Harbor Island, the easternmost of the group, is nearly 2¼ miles long in a **NW.** and **SE.** direction; its southeastern point, **Black Head,** is a high, bare, rocky hill, and prominent from eastward. **Steels Harbor Island** is about ⅞ mile in diameter, and lies southwestward of Head Harbor Island; there is a passage between them, obstructed by islands and ledges, which is called **Head Harbor,** near its southern end. This harbor affords a sheltered anchorage with from 15 to 21 feet of water, but is very small, and has unmarked dangers on both sides of the channel and entrance; in 1902 a fish weir formed an obstruction in the harbor. Strangers should not enter without a pilot. A peculiarity of the entrance to Head Harbor is that the rocks of Man Island, the eastern side of the entrance, are dark, and those on the western side are light in color.

Mistake Harbor is on the northwestern side of Steels Harbor Island, and is entered from southward through the **Main Channel Way,** a deep but narrow channel leading between Steels Harbor Island on the east and Mistake and Knights islands on the west. Moose Peak Lighthouse marks the western point at entrance. This harbor, though small, affords good shelter, with 3 to 7 fathoms of water. The best anchorage is just northwestward of the northern end of Knights Island, in 3 to 4½ fathoms. **Water Island Channel** leads between Mistake Island on the east and Water Island on the west, into Mistake Harbor; it is unfit for navigation, having numerous unmarked dangers.

The waters northward of the Mud Hole between Great Wass Island and Head Harbor Island are locally known as the **Eastern Bay;** a thorough local knowledge is required for their navigation.

Mud Hole Channel is westward of Water Island and leads in a northwesterly direction to the **Mud Hole,** a long, narrow cove in the eastern side of Great Wass Island, much used as an anchorage by fishermen who enter the cove at high water and lie aground at low water. There is good anchorage for a limited number of vessels at the entrance to **Sand Cove** and **Mud Hole,** in 14 to 30 feet of water, soft bottom. On the western side of the Mud Hole Channel and extending in a northwesterly direction nearly 1 mile to Little Cape Point, is an irregular line of rocks and ledges, known generally as **Black Ledges,** many of them bare at half tide and low water; these can be avoided by favoring the islands on the eastern side of the channel. **Freeman Rock,** a bare rock about 40 feet high, is on the western side of the entrance, but as the ledges before mentioned extend some distance eastward of Freeman Rock, it should be given a berth of ¼ mile. Westward of the rock and between it and Little Pond Head, the southeastern point of Great Wass Island, is a bight which a stranger should not

* Shown on charts **102,** scale $\frac{1}{80,000}$, price $0.50; **304,** scale $\frac{1}{40,000}$, price $0.25.

enter; it has no anchorage and the line of ledges before mentioned make it impossible for a stranger to stand northward between them without the greatest risk.

Great Wass Island is 4 miles long in a **N.** and **S.** direction and about 1¼ miles wide at its widest part; at its northwestern end **Beals Island**, about 1¼ miles long in a **N.** and **S.** direction and ⅝ mile wide, is joined to it by ledges which are bare at low water.

Crumple Island is a high, bare, rocky island showing several knubbles; on the northern end of the highest is a flagstaff and lookout house for the life-saving station. The island is about ⅝ mile west of **Pond Point**, the southwestern point of Great Wass Island, and there is a deep channel between them, but a stranger should never use it. **Fisherman Island** lies northwestward of Crumple Island, and between the two are shoals and ledges leaving a passage for boats only. This island has several small huts and dead trees on it. **Browney Island** lies north of Fisherman Island and is surrounded by ledges and rocks; the passage between them can only be used by boats. From the northern end of Browney Island a broken line of ledges and rocks extend to Great Wass Island. There is a channel with about 11 feet of water through these ledges, but it is not marked and is used only by those acquainted with the locality.

The waters westward of Great Wass Island are locally known as **Western Bay**. **Egg Rock**, a bare, rocky islet, lies about 1 mile westward of the southern end of Fisherman Island. There are numerous rocks and ledges between Crumple Island and Egg Rock. **Western Egg Rock** is a small, bare, rocky islet about ¼ mile northward of Egg Rock. **Sea Horse Rock** is a small rock, bare at half tide, lying ⅝ mile westward of Egg Rock.

There are several groups of islands lying northwestward of Egg Rock and extending westward from the northern end of Great Wass Island to Nash Island. The principal of these are Ram Islands, Stevens Island, the Drisco Islands, Sand Islands, Plummer Island, Flat Island, and Cone Island; beside these there are numerous rocks and ledges, and the islands on the south side of Moosabec Reach. **Black Rock** is a dangerous cluster of rocks showing out of water, which lie nearly 2¼ miles **SSE. ¼ E.** from Nash Island Lighthouse and 3¼ miles **WNW. ¼ W.** from Egg Rock.

For **tides** at Moose Peak Lighthouse, see table, page 27.

GENERAL DIRECTIONS, MISTAKE HARBOR.

This anchorage should only be used by strangers in cases of extreme necessity, as a fair wind is necessary to enter or leave.

Give the ledges southwestward of Moose Peak Lighthouse a good berth and steer so as to pass 400 yards eastward of the lighthouse; then steer about **NW. ⅝ N.**; this course will lead fair into the Main Channel Way between Steels Harbor Island on the east and Knights Island on the west. When in the middle of the channel way steer about **NW. ¼ N.**, and when the northern end of Knights Island is on the port beam steer a little more westward and anchor in 19 to 24 feet water, soft bottom, before it bears eastward of *SE.*

Remarks.—Vessels delayed by a head wind in Mistake Harbor sometimes beat out through the Mud Hole Channel, but it requires local knowledge to avoid the many dangers which lie on both sides. **Knights Island** is the long, narrow island on the west side of the Main Channel Way; northwestward of this island are several small islands and a number of ledges.

When coming to anchor care should be taken to keep clear of a small ledge, which shows bare at low water at its southern end and lies ¼ mile **NNW. ¼ W.** from the northern end of Knights Island, and 650 yards **WSW.** from the northern end of Halls Island; it is about 150 yards long **NNW.** and **SSE.** and 30 yards wide, with deep water on all sides. At low water the ledge is easily avoided as it can then be seen, but strangers entering after the ledge is covered, should anchor before they are on a line drawn from the northern end of Halls Island to the northernmost of the bare rocks on the western side of the harbor, northwestward of Knights Island.

GENERAL DIRECTIONS, MUD HOLE CHANNEL.

Strangers should not use this anchorage, except in cases of necessity.

Bring Moose Peak Lighthouse to bear *NE.*, distant between ⅜ and ½ mile, and steer **NW. ½ N.** The shore of Water Island should be left about 300 yards on the starboard hand, and Sandy Point should be ahead. When the northern end of Water Island bears southward of *E.* the Black Ledges will have been passed.

Continue the **NW. ½ N.** course, and when the bight at the entrance to Mud Hole and Sand Cove is opened, haul westward and anchor midway between Sandy Point and Mud Hole Point in 3 to 6 fathoms of water, soft bottom.

Remarks and dangers—Channel Rock, the southeasternmost of the Black Ledges, is a small rock showing bare except at high water, and lies 600 yards **ENE. ¼ E.** from Freeman Rock; it marks the western side of the entrance to Mud Hole Channel. The other dangers are avoided by closely following the directions. The eastern shore of Great Wass Island, between Little Cape Point and the Mud Hole, can be approached as close as 200 yards.

Sandy Point is low and rocky and usually has a fish weir near its end. **Mud Hole Point** is high, with bare, rocky faces, and its top covered with a scrubby growth of bushes and trees.

When well up toward Mud Hole Point some houses at the head of Sand Cove, the small cove just westward of Sandy Point, will show conspicuously.

MOOSABEC REACH*

is the narrow passage west of Chandler Bay, leading between the mainland on the north and the group of islands between Chandler Bay and Pleasant Bay on the south. Mark Island is the most prominent guide to the eastern entrance and Nash Island Lighthouse to the western entrance. This passage is an important thorofare and is much used by vessels of 12 feet or less draft in the daytime; a draft of 23 feet can be taken through at high water. Sailing vessels of over 12 feet draft are advised to take a pilot. The eastern entrance has been straightened and dredged to a width of 300 feet and a depth of 14 feet; it is well buoyed and can readily be followed in the daytime in clear weather, but no vessel should attempt to pass through at night. Pilots can be had at the eastern entrance by sending to Kelleys Point, and at the western entrance by sending to either Cape Split Harbor or Tabbott Narrows. The channel westward of the dredged channel has a least width of 300 yards in several places before reaching Tabbott Narrows, but it is straight, and the most prominent dangers are marked by buoys or spindles. Vessels headed off by the wind or caught in a fog while passing through the Reach anchor anywhere in the channel where the bottom is soft.

Jonesport is a village on the north shore about 1¼ miles west of Kelleys Point. Steamers from Portland stop here, and there is telegraphic communication with **Addison**, the nearest point on the railroad. The depth of water at the end of the steamboat wharf is about 11 feet at low water; the other wharves run dry. Pilots for Chandler River and the waters eastward, and also as far west as Mount Desert, can generally be found at Jonesport by making inquiries on shore.

Between **Hopkins Point**, the point on the north shore about 1½ miles westward of Jonesport, and Tabbott Narrows a large bight makes into the northern shore. Several islands lie in the entrance at the eastern side of the bight, and near its head is **Moose Island**, which is connected at its northern end with the mainland by a causeway. The narrow, crooked channel on the eastern side of Moose Island is known as **Indian River**, and that on the western side as **West River**. These waters are of no importance and are visited only by local craft.

Ice during January and February obstructs navigation in Moosabec Reach.

Tides.—The mean rise and fall of tides at Jonesport is 11.7 feet (see table, page 27).

The **tidal currents** have considerable velocity in the dredged channel, particularly at the beacon on the stone jetty which extends northwestward from Novas Rocks.

SAILING DIRECTIONS, MOOSABEC REACH.

Vessels passing through the Reach should be guided entirely by the buoys and spindles, as the channel is narrow in places, with rocks and ledges on both sides. The following directions should enable a vessel of 12 feet draft to pass through at ordinary low water with a leading wind.

A detailed description of the numerous rocks and ledges on both sides of the channel would only confuse the navigator.

1. ***From Eastward.***—Bring Libby Islands Lighthouse to bear *N.*, distant ¾ mile, and steer about **W.** by **N.** Leave The Brothers and Pulpit Rock (a bare, rocky isle) about ¼ mile on the starboard hand, and Jumpers Ledge buoy (nun, red and black

*Shown on charts **102**, scale $\frac{1}{80,000}$, price $0.50; **304**, scale $\frac{1}{40,000}$, price $0.25.

horizontal stripes) about the same distance on the port hand; Mark Island will be on the port bow. Having stood on this course about 1 mile after Pulpit Rock bears abeam, steer **W.** so as to pass 400 yards northward of Mark Island. Red spar buoys Nos. 2 and 2½ will be made on the starboard bow, and a black can buoy No. 1 and black iron spindle with cage on top will be make on the port bow.

Leave black can buoy No. 1 about 100 yards on the port hand and steer about **W.** ½ **N.**, heading so as to leave red spar buoy No. 2½ about 75 yards on the starboard hand. From this buoy shape the course so as to leave red spar buoys Nos. 4, 6, 8, and 10 about 40 yards and the post-light (on a red iron spindle) about 65 yards on the starboard hand. On this course a stone beacon on the end of a stone jetty should be left about 60 yards on the port hand. When the post-light is abeam steer about **WNW.** ¾ **W.**, heading so as to pass 30 yards northward of Horse Ledge buoy (can, black, No. 9).

From Horse Ledge buoy steer **W.** ⅝ **N.**; when nearly up to the steamboat wharf at Jonesport, red nun buoy No. 12 should be left 100 yards on the starboard hand. Continue the course, giving the islands on the south side of the channel a berth of 300 yards. *Fessenden Ledge* (marked by a red iron spindle with spherical cage on top) will be made nearly ahead, and should be left 150 to 200 yards on the starboard hand. After passing Fessenden Ledge, black spar buoy No. 11 will be left on the port hand. When this buoy is about ¼ mile distant on the port quarter and bears about *SE.*, shape the course **SW.** by **W.** ¼ **W.**, leaving *Shabbit Island*, low, flat, covered with trees, and rocky fringe at the water's edge, about ¼ mile on the port hand. A red spar buoy, No. 14, and black spar buoy, No. 13, will be made ahead, and the **SW.** by **W.** ¼ **W.** course should lead midway between these buoys and through *Tabbott Narrows*, the passage between Ram and Sheep islands. When past these islands, shape the course **WSW.** and pass about ¼ mile northward of *Cone Island*, the large island which lies close-to and northeastward of Nash Island.

With Nash Island Lighthouse bearing *SE.*, distant ⅜ mile, a **SW.** ½ **W.** course, made good for 8¼ miles, will lead to the whistling buoy off Petit Manan; a **WNW.** ⅝ **W.** course, made good, will lead for the northern end of Pond Island and entrance to Narraguagus Bay; a **N.** ½ **W.** course, made good, leads into the entrance of Pleasant Bay.

Remarks and dangers.—There are two channels for entering from eastward; the northern channel should be used and great attention paid to the buoys, which must not be mistaken for those marking the southern channel (Seguin Passage).

The principal dangers in approaching are Jumpers Ledge and Eastern Ledges (described on pages 53, 54); the dangers at the eastern entrance and along the Reach are so numerous that no descriptions of value to the navigator can be given (see description of Moosabec Reach).

1 A. ***From Westward.***—With Nash Island Lighthouse bearing *SE.*, distant ⅜ mile, steer **ENE.**, heading so as to pass at least ¼ mile *N.* of Cone Island and directly for Tabbott Narrows; Shabbit Island (light-colored rocky island, wooded on top) should be ahead and seen between Sheep and Ram islands. Red spar buoy No. 14 and black spar buoy No. 13, at the eastern entrance of the Narrows, should be made ahead. Pass midway between these buoys and steer **NE.** by **E.** ¼ **E.**, and when black spar buoy No. 11, which marks the northern end of Shabbit Island Ledge, bears *SE.*, steer **E.** ⅝ **S.** and reverse the directions in section 1, foregoing.

Remarks.—The rocks on the eastern side of Tabbott Narrows are light in color and those on the western side are dark.

CAPE SPLIT HARBOR.*

This is an irregularly-shaped cove mostly taken up by flats and ledges, between which a channel about 200 yards wide and 1 mile long affords good anchorage for a limited number of vessels. The depth in the channel varies from 7 fathoms near the entrance to 12 feet near its head, and the holding ground is good. The flats

*See footnote, page 57.

are soft mud, and small vessels sometimes haul out on them to overhaul and clean bottom. The entrance, bearing **NE. ¾ N.** from Nash Island Lighthouse, is about 350 yards wide and has several dangerous ledges off its eastern point that show bare at low water. The harbor is sometimes used by vessels bound through Moosabec Reach, but it is not a desirable anchorage for strangers, Pleasant Bay being easier of access and a better anchorage. Pilots for Moosabec Reach can be obtained in Cape Split Harbor by inquiring on shore.

PLEASANT BAY AND RIVER.*

Pleasant Bay lies north of Nash Island and has an excellent anchorage, with 14 to 18 feet water, good holding ground. The entrance of the bay is between Cape Split on the east and Flint Island on the west, and is about 2 miles wide; the available width for entering, however, is only 1¼ miles on account of a group of islands on the eastern side of the entrance. The bay extends 3¾ miles in a **NNE.** direction above Flint Island and gradually contracts in width up to Guard Point, where Pleasant River empties into it. There are numerous islands and ledges in the bay, but the most important dangers are marked by buoys, so that in the daytime in clear weather vessels of 15 feet draft can make the anchorage at low water.

Flint Island Narrows is a deep passage leading from Pleasant Bay to Narraguagus Bay, between Flint and Dyers islands. It is used principally by steamers and is not recommended for sailing vessels on account of strong tidal currents, and ledges which make out from the southern shore of Dyers Island and contract the channel to a width of about 200 yards. A black spar buoy is placed on the northern edge of the ledges making off from the northeastern side of Flint Island and marks the eastern entrance to the Narrows.

On the western side of Pleasant Bay, between Ripleys Neck and Dyers Island, is the entrance to Harrington Bay and River. **Strout Island**, high, covered with a scrubby growth of trees near its southern end and the highest point of the island cleared, is 3¾ miles **NNW.** from Nash Island Lighthouse and in the middle of the entrance to Harrington Bay. The channel generally used by vessels leads westward of Strout Island.

Pleasant River has a narrow and crooked channel with a least depth of 5 feet at low water at one place just below Addison Point; above this the river is navigable at high water as far as the village of **Columbia Falls**, about 9½ miles above its mouth. Eastward of Guard Point, in the entrance of the river, is an excellent though narrow anchorage with 3 to 7 fathoms, and in the channel for a distance of 1¼ miles above the entrance good anchorage will be found in 3½ to 6 fathoms. Strangers should not attempt to enter the river without a pilot.

Addison Point, a village about 4½ miles above the mouth of Pleasant River, has a little trade. Vessels of 12 feet draft go up as far as this; there is from 2 to 4 feet of water alongside the wharves. Just above Addison Point the river is crossed by a bridge (width of draw about 35 feet). The village of **Columbia Falls** is 5 miles above and has railroad communication; the deepest draft of vessels trading there is 9 feet. The wharves run dry at low water.

The **channel** leading into the bay and as far up as Night Cap Island is in no place less than ½ mile in width with a least depth of 6 fathoms. Above Night Cap Island a channel with a least depth of 16 feet leads eastward and one with 17 feet westward of Barton Ledge and Birch Islands; these channels unite at the mouth of the river close to Seaveys Point—the eastern point at the entrance—where the width is about 250 yards and the depth from 3¾ to 5½ fathoms. The channel holds this width and depth for ¾ mile above its mouth; it then narrows very rapidly, leading in many places between flats that are bare at low water.

Anchorage.—The best and most frequently used anchorage in Pleasant Bay is southeastward and eastward of Birch Islands, where there is excellent holding ground in 13½ to 18 feet water, sheltered from all winds. There is also good anchorage in 19 to 40 feet of water off the mouth of the river.

Fish weirs will usually be found along the eastern and western shores of the bay above the southern end of Birch Islands, between them and Raspberry Island, and on the shoals making eastward from Guard Point; they do not extend out in the channel so as to interfere with navigation.

Pilots can generally be found at Cape Split or in Narraguagus Bay, and can always be obtained from the anchorage in the bay. Strangers bound to Addison Point or Columbia Falls should take a pilot.

Ice obstructs navigation in the river from December to April.

Tides.—The mean rise and fall of tides is 11 feet at Nash Island and 11.3 feet at Addison Point. It is high water at the latter place 34 minutes later than at Nash Island (see table, page 27).

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*Shown on charts **102**, scale $\frac{1}{80,000}$, price $0.50; **305**, scale $\frac{1}{40,000}$, price $0.25.

SAILING DIRECTIONS, PLEASANT BAY.

The following directions lead to the anchorage and are available for vessels of 14 feet draft at low water; vessels of greater draft should take a pilot.

1. ***Approaching and Entering, from Eastward.***—From the whistling buoy lying 2 miles *SSE.* from Moose Peak Lighthouse, steer **W. ¼ S.**, or, if closer inshore, shape a course so as to leave the islands at least ¾ mile on the starboard hand. When Egg Rock, the westernmost island, bears *N.*, distant from ¾ mile to 1¼ miles, steer **WNW.** When Nash Island Lighthouse bears *N.* by *W.* ½ *W.*, shape the course **NNW. ¼ W.** so as to pass about ⅝ mile westward of the lighthouse, and when it bears *E.* steer about **N. ¼ W.**, leaving Coles Ledge buoy about ¼ mile on the port hand and heading so as to pass about ½ mile westward of Norton Island. When Norton Island Ledge is on the starboard beam, distant about ⅝ mile, steer **NNE. ½ E.**; leave Night Cap Island about 300 yards on the starboard hand, and when past the island steer about **NE.** by **E.** and anchor eastward of the south end of the Birch Islands in 14 to 17 feet water, soft bottom.

If bound into Pleasant River take a pilot.

Remarks and dangers.—When Egg Rock bears **N.** and the course is changed to **WNW.**, **Sea Horse Rock**, bare at half tide and breaking at high water, will be seen ⅝ mile westward of Egg Rock. On the **WNW.** course Black Rock will be made on the starboard bow; and on the **NNW. ¼ W.** course it should be left ⅝ mile on the starboard hand, and **Flint Island**, high, round, bare hill, with scattered trees on its western side, will be just on the port bow.

Black Rock is a group of rocks ¼ mile long in a northwest and southeast direction, lying 2¼ miles **SSE. ¼ E.** from Nash Island Lighthouse. There is deep water all around these rocks, some of which show bare at high water. A spot with 6¼ fathoms over it lies ⅝ mile **S. ¼ E.** from Black Rock.

A ledge, the southern end of which shows bare, extends about 500 yards southward from Nash Island.

On the **N. ¼ W.** course Ripleys Neck and Narrows Island Ledge will be ahead. Norton Island Ledge will be made on the starboard bow and Coles Ledge buoy will be left about ⅝ mile on the port hand.

Coles Ledge, a small rock, showing bare near low water, with deep water around it, lies about ¼ mile eastward of Flint Island; a buoy (spar, black, No. 1) is placed about 100 yards eastward of the ledge. The southeastern side of Flint Island should be given a berth of at least ¼ mile.

Big Pot, Pot Rock, and **The Ladle** are rocky islets lying eastward of the channel into Pleasant Bay; Big Pot, the westernmost, is about on a line between Nash and Norton islands.

Norton Island Ledge, showing bare in spots at high water, lies nearly ¼ mile **W.** from the southwestern point of Norton Island. The reef, making southward from Norton Island, is marked by a black iron spindle with cage on top. Vessels entering the bay should pass ⅝ mile westward of Norton Island to clear the ledge.

On the **NNE. ½ E.** course Birch Islands will be ahead and Barton Ledge a little on the port bow; **Night Cap Island**, smooth, round top, covered with grass, will be on the starboard bow.

Narrows Island Ledge is a small ledge, dry at half tide, and lies on the western side of the channel, ⅝ mile **SW.** from the southeastern point of Narrows Island. A spot with 13 feet of water over it lies about 400 yards **S.** from the southeastern point of Narrows Island; this is left on the port hand when standing up the bay.

Night Cap Ledge extends in a broken line for nearly 700 yards south of Night Cap Island. A part of the ledge nearest the island is dry at half tide; there are spots with 7 and 14 feet over them southward of the dry part of the ledge.

Barton Ledge is a small ledge, showing bare at half tide and surrounded by 3¼ to 5 fathoms of water, about 500 yards **SSW.** from the southwestern point of Birch Islands; it is marked by a buoy (spar, red and black horizontal strips) placed about 50 yards southward of the ledge. The buoy is left on the port hand when bound east of Birch Islands, and on the starboard hand when bound west of the islands.

Bunker Ledge, dry at half tide, lies westward of the southernmost Birch Island and is marked off its southeastern side by a buoy (spar, black, No. 3). The ledge extends about 225 yards northward and westward of the buoy; the channel westward of Birch Islands leads eastward of the buoy, and there is a depth of 14 feet westward of the ledge.

When standing eastward between Night Cap and Birch islands, **Ports Harbor**, a narrow cove in the eastern shore, will be ahead; the eastern shore at the anchorage should not be approached closer than 250 to 300 yards.

The channel to the anchorage in the mouth of the river leads along the eastern side of Birch Islands, which should be given a berth of about 250 yards.

1A. ***Approaching and Entering, from Westward.***—From the whistling buoy, 1 mile *S.* of Petit Manan Lighthouse, steer **NE. ½ E.** about 8¼ miles; Nash Island Lighthouse will then bear about *SE.*, distant ⅝ mile. From this position steer **N. ¼ W.**, and proceed as directed in section 1, preceding.

Remarks.—On the **NE. ½ E.** course, Nash Island Lighthouse will be made a little on the starboard bow and Flint and Shipstern islands on the port bow; the course leads about ⅝ mile westward of Nash Island Lighthouse. On the **N. ¼ W.** course, Flint Island is left about ½ mile on the port hand and Norton Island Ledge about ⅝ mile on the starboard hand. The remarks in section 1, preceding, should be applied for the course above Norton Island Ledge.

Dangers.—**Petit Manan Reef** is described in section 1 A, "Sailing Directions, Narraguagus Bay," page 64.

Simms Rock, a rocky spot with a least depth of 6 feet over it, lies 1¾ miles **S.** from Petit Manan Lighthouse; it is marked by a buoy (nun, red and black horizontal stripes). The buoy should be given a berth of at least ¼ mile; there is deep water around this spot.

Southeast Rock, a small rock with a least depth of 5 feet over it, lies about 3¼ miles **SSE. ½ E.** from Petit Manan Lighthouse, and nearly 1⅞ miles **SE.** by **E.** from Simms Rock buoy. The rock is marked by a buoy (can, red and black horizontal stripes), which should be given a berth of ¼ mile.

Jo Leightons Ground, least water 15 feet in one spot, lies 2⅛ miles **NE.** by **E. ½ E.** from Petit Manan Lighthouse; it is not marked, and is left nearly ½ mile on the port hand when on the **NE. ½ E.** course.

Jackson Ledge, nearly ¼ mile in diameter, with a least depth of 3¾ fathoms, lies 2½ miles **ESE. ¾ E.** from Petit Manan Lighthouse; this ledge is not marked, but is left about 1¼ miles on the starboard hand when on the **NE. ½ E.** course.

Tibbett Rock, a small rock with a least depth of 12 feet over it, lies 3½ miles **E.** from Petit Manan Lighthouse. The rock is not marked, and is left well on the starboard hand when on the sailing line.

Jordans Delight Ledge is a long, scattered ledge southeastward of Jordans Delight, the southern end, which shows bare at low water and is marked by a spindle, is left about ⅞ mile on the port hand when on the **NE. ½ E.** course from the whistling buoy off Petit Manan. See also page 65.

Coles Ledge and other dangers in Pleasant Bay are described under section 1, preceding.

HARRINGTON BAY AND RIVER.*

Harrington Bay makes northward from the western side of Pleasant Bay; its entrance lies **NNW.** from Nash Island Lighthouse. It is separated from the upper part of Pleasant Bay on the east by Ripleys Neck, and from Narraguagus Bay on the west by Fosters Island. The bay extends 2½ miles in a **N.** by **E.** direction from Strout Island to Chamberly Island, where it is met by Harrington River from northeastward and the waters from Flat Bay and Mill River from northwestward. It has a depth in the channel of 4¾ fathoms, and good anchorage in 5 to 7 fathoms of water, but is seldom used except by vessels owned in the vicinity or by those acquainted with the locality.

Flat Bay and **Mill River** are mostly bare at low water.

Harrington River has a narrow, crooked channel, with a depth of only 2 feet at low water. The town of **Harrington** is at the head of navigation on Harrington River, about 4 miles above its mouth; shipbuilding is the principal industry. The greatest draft taken up to the town is 12 feet; the usual draft 6 to 10 feet. There is 2 feet of water alongside the wharves at low water.

Dyer Island Narrows, the passage between Dyer Island and Fosters Island, has a depth of 9 feet at low water, and connects Harrington Bay with Narraguagus Bay. This passage is the one commonly used by the steamer from Portland, but should not be attempted by strangers or sailings vessels, as it has many unmarked dangers and strong currents.

Ice forms in the river and in the bay between December and April as far down as Ripleys Neck.

Tides.—The mean rise and fall of tides is the same as in Narraguagus Bay (see table, page 27).

GENERAL DIRECTIONS, HARRINGTON BAY.

Strangers are advised not to enter Harrington Bay without a pilot. The dangers are numerous, as will be seen by consulting the charts.

From Pleasant Bay to an Anchorage in Harrington Bay.—Having followed the directions for entering Pleasant Bay, page 60, when abreast of Norton Island Ledge stand over toward the western shore, course about **NW.** and keep southward of Narrows Island Ledge and the ledges eastward of Strout Island. Follow the eastern shore of Dyer Island, giving it a berth of 400 yards, and when the western side of Strout Island bears *N.* steer for it so as to pass eastward of *Otter Island*, the small island at the mouth of a small cove *SW.* from Strout

*Shown on charts **102**, scale $\frac{1}{80,000}$, price $0.50; **305**, scale $\frac{1}{40,000}$, price $0.25.

Island. Give the western shore of Strout Island a berth of about 100 yards, and when abreast Eastern Flats buoy (spar, black, No. 1) steer about **NNE.** leaving *Shag Island*, a small, bare rock which will be seen on the starboard bow, 125 yards on the starboard hand. When Shag Island is a little abaft the beam steer **NE.**, leaving Shag Island 125 yards on the starboard hand, and follow the eastern shore of the bay, giving it a berth of about 300 yards. Anchor anywhere in the channel on the eastern side of the bay where the depth of water and character of the bottom are favorable.

If bound into Harrington River, take a pilot.

Remarks.—By closely following the above directions a least depth of 4¾ fathoms can be taken to an anchorage. Care should be exercised when passing Shag Island, as there is a ledge with 5 feet over it about 300 yards northwestward of the island. The sailing line leads between the island and ledge. The western side of the bay is shoal and should be avoided by strangers.

NARRAGUAGUS BAY*

lies about **N.** by **E.** from Petit Manan and **NW.** by **W.** from Nash Island. The lower part of the bay is a well-sheltered anchorage much used as a harbor of refuge in all seasons by vessels up to 18 feet draft. The principal dangers in the channels are buoyed, and the lighthouses on Nash, Petit Manan, and Pond islands (Narraguagus Light)—see table, page 16, are guides for the entrance. Trafton Island lies in the middle of the lower end of the bay, with a good channel on each side. The upper end of the bay and the western shore above Trafton Island are shallow. The eastern shore is formed by Dyer and Fosters islands, between which Dyer Island Narrows, a narrow buoyed channel with 9 feet at low water, leads into Harrington Bay; north of Fosters Island is **Back Bay,** which runs dry at low water with the exception of a small channel into Harrington Bay.

Douglas Island Harbor lies north of the Douglas Islands and west of Pond Island. It has from 4 to 6 fathoms water but is seldom used except by fishermen, the anchorage above Trafton Island being better. A narrow, crooked channel leads from the western side of Douglas Island Harbor, between Joe Dyers Point on the north and Bois Bubert Island on the south, into Pigeon Hill Bay, but it is not available for strangers on account of numerous unmarked rocks and ledges.

The harbor may be entered from southward between the islands, but the passages are narrow and a stranger should not attempt them.

Narraguagus River empties into the northwestern part of the bay and is a narrow stream which runs dry in places at low water; it is crossed by a bridge at Millbridge.

Millbridge is a town about 2 miles above **Turners Point,** the western point at entrance to the Narraguagus River. The principal industries are canning fish and shipbuilding. Vessels of 16 feet draft can go up to the town, but vessels of over 5 feet draft lie aground at low water; the usual draft is about 9 feet. There is from 5 to 8 feet of water at the ends of some of the wharves at low water. The steamer from Portland stops at the steamboat wharf 2½ miles below the town; sawdust from the lumber mills is gradually shoaling the channel, which was dredged to a depth of 11 feet to the steamboat wharf, and the depth in 1902 was about 8 feet. There is communication by telegraph and telephone with Cherryfield.

Cherryfield, 4 miles above Millbridge, has railroad communication. Its principal industry is lumber, which is brought down to Millbridge in scows at high water.

Prominent objects.—Nash Island Lighthouse (see table, page 16) is well eastward of the entrance. **Petit Manan Lighthouse** (see table, page 16) is about **SSW. ¾ W.** from the entrance, and the most conspicuous and easily recognized object when coming from westward. **Pigeon Hill,** round, smooth, bare top, 307 feet high, bears **N. ½ E.** from Petit Manan. **Bois Bubert Island,** large, bare, desolate looking, whitish rocks, with few scrubby trees, lies **N.** by **E. ½ E.** from Petit Manan; it can be readily distinguished by its color and barren appearance. **Jordans Delight** is a small, high island, wooded except at its extreme northern end, lying about 5 miles **NE. ½ N.** from Petit Manan and 3½ miles **W. ½ S.** from Nash Island. **Pond Island,** seen from southward, appears like a bare, conical hill, about 160 feet high. **Narraguagus Lighthouse** (see table, page 16) is on the eastern side of the island.

The group of islands between Pond Island and Bois Bubert Island are the **Douglas Islands. Shipstern Island,** recognizable by its peculiar appearance, is small, high, covered with trees, and has perpendicular, corrugated, rocky bluffs on its south side. It lies 2⅝ miles **NW.** by **W. ¼ W.** from Nash Island and just westward of Flint Island, which is much the larger. **Trafton Island,** about 1½ miles **NNE.** from Pond Island, is fair in the middle of

*Shown on charts **102,** scale $\frac{1}{80,000}$, price $0.50; **305,** scale $\frac{1}{40,000}$, price $0.25.

the entrance to the bay. The large island eastward of Trafton Island and north of Shipstern Island is **Dyer Island**, which forms a part of the eastern shore of the bay.

Channels.—The approach from eastward is comparatively free from dangers; from westward around Petit Manan there are several ledges, some of them marked, which can be avoided by watching the bearings of the lighthouse. The eastern channel passes close to the east side of Trafton Island and is about ¼ mile wide. Tommy Island and Western Reef lie on the eastern side of this channel. The western channel is about ⅛ mile wide between Trafton Island and Baldwins Head; the Lower Middle Ground lies ¼ mile from the western shore above Baldwins Head. The channel from Turners Point to Millbridge is narrow, crooked, and shoal, and should not be attempted by a stranger without a pilot.

Anchorages.—The usual anchorage for vessel seeking shelter is between Trafton Island and the Lower Middle Ground buoy, in 21 feet water, soft bottom; vessels of 10 feet draft or less sometimes anchor in 14 to 17 feet water north of Trafton Island, about midway between it and the spindle on Half Tide Ledge. Vessels bound up to Millbridge anchor in 14 to 16 feet water about ¼ mile east of Turners Point, the steamboat wharf bearing about **WNW.** Good anchorage in 24 feet water, soft bottom, will be found about ⅜ mile **NE.** from the spindle on Half Tide Ledge.

Pilots are not necessary to enter the bay. A stranger desiring a pilot should get one at Little River or Jonesport to the eastward. or at Southwest Harbor or Bar Harbor to the westward. Fishermen who are good pilots can usually be found, if the weather is fine, on the ledges off Petit Manan. Pilots to take vessels up to Millbridge can be found at Turners Point.

Repairs.—There is a set of blocks at Millbridge on which small vessels are repaired.

Ice seldom obstructs navigation except in January and February, during which months the river is frozen to its mouth.

For **tides** see table, page 27.

SAILING DIRECTIONS, NARRAGUAGUS BAY.

1. ***Approaching and Entering, from Eastward.***—*I. Passing eastward of Trafton Island.*—Follow the directions for approaching Pleasant Bay (page 60); bring Nash Island Lighthouse to bear *N.*, distant about 2½ miles, and steer about **NW. ¾ N.** so as to clear the western end of Trafton Island. When Narraguagus Lighthouse bears *SW.*, distant nearly 1 mile, steer **NNE.** Pass midway between Trafton and Tommy islands, and when the northern end of Tommy Island is abeam steer **N.** Anchor anywhere northward or eastward of Half Tide Ledge spindle (red, with wheel on top) in 13 to 24 feet of water.

Or, continue the **N.** course until the steamboat wharf just above Turners Point bears *NW.* by *W.* ½ *W.*, and then steer for the wharf and anchor in 14 feet water ⅝ mile from the wharf.

Passing westward of Trafton Island.—Continue the **NW. ¾ N.** course as directed in paragraph I, preceding, and give the southern end of Trafton Island a berth of about 300 yards. Then haul northward, course **N.** by **E.** ¼ **E.**, and anchor anywhere between Trafton Island and Lower Middle Ground buoy (spar, black, No. 5).

Or, continue the **N.** by **E.** ¼ **E.** course midway between Half Tide Ledge spindle and Lower Middle Ground buoy, and anchor in 14 feet water with the steamboat wharf bearing *NW.* by *W.* ½ *W.*, distant ⅝ mile.

To anchor in Douglas Island Harbor.—On the **NW. ¾ N.** course, when Narraguagus Lighthouse bears *SW.*, distant about 1 mile, steer about **WNW.**, and when Pond Island Ledge buoy (spar, black, No. 3) bears *SE.*, distant about ¼ mile, steer **WSW.** until the northern end of Pond Island bears *SE.*, then change course southward and anchor ¼ to ½ mile westward of Pond Island, with the highest part of the island bearing southward of *ESE.*, in from 4 to 6 fathoms of water.

Remarks and dangers.—Strangers wishing to go to Millbridge should take a pilot off Turners Point. **Flint Island Narrows**, separating Flint Island and Dyer Island, connects Narraguagus and Pleasant bays, but the passage should not be attempted by strangers.

On the **NW. ¾ N.** course **Baldwins Head**, showing bare and light-colored, will be ahead and open a little westward of Trafton Island. Shipstern Island will show prominently on the starboard bow, and Jordans Delight and Pond Island on the port bow.

Mackerel Rock, a small ledge with 19 feet over it, lies about ¾ mile **E.** ⅞ **S.** from the northern end of Jordans Delight, and ⅝ mile **NE.** from Black Ledge; the latter ledge in range with Petit Manan Lighthouse passes over Mackerel Rock. There is deep water around the rock.

Black Ledge is described under section 1 A, following.

On the **NNE.** course, when passing eastward of Trafton Island, Western Reef buoy (spar, red, No. 2) should be left about ¼ mile on the starboard hand. Above Trafton Island care should be taken not to be set on Half Tide Ledge, marked by a spindle (red, with wheel on top).

Western Reef, making off ⅝ mile from the southern end of Tommy Island, is marked at its end by a red spar buoy (No. 2) lying ½ mile **NW.** ¾ **W.** from Shipstern Island.

On the **N.** by **E.** ¼ **E.** course, passing westward of Trafton Island, the water shoals gradually toward the head of the bay. Trafton Island is bold-to on its southern and western sides and may be approached as close as 200 yards.

Trafton Island Ledge is a small, bare rock lying in the middle of the entrance to the cove formed by the northern points of Trafton Island. Vessels should not attempt to pass between this ledge and the island.

Half Tide Ledge, partly bare at low water, is about 600 yards long in a **N.** and **S.** direction, and about 150 yards wide; it lies ¾ mile **N.** from the middle of Trafton Island, and is marked near its northern end by a spindle (iron, wheel on top).

Lower Middle Ground is an extensive shoal on the western shore, commencing a short distance above Baldwins Head and extending to Turners Point. It extends from ¼ to ⅝ mile from the shore, has from 2½ to 12 feet of water over it, and is marked on its eastern side by a buoy (spar, black, No. 5) lying ½ mile **W.** ½ **S.** from Half Tide Ledge spindle.

Making an anchorage in Douglas Island Harbor, North Point of Pond Island Ledge buoy (spar, black, No. 3) will be left on the port hand. The northern end of Pond Island should not be approached nearer than ½ mile to avoid the shoals making out from it. The north end of Dyer Island just showing north of Trafton Island clears these shoals.

Pond Island Ledge, making northward from Pond Island, is marked at its northern end by a buoy (spar, black, No. 3) lying about ⅝ mile northward of the island.

1 A. ***Approaching and Entering, from Westward.—Passing eastward of Trafton Island.***—Shape the course so as to pass 1 mile southward of Petit Manan Lighthouse and close to the whistling buoy. From the whistling buoy steer **NNE.** ⅞ **E.** for the western end of Jordans Delight. Or, steer so as to pass ½ mile eastward of Petit Manan Lighthouse; bring it to bear *SW.* ½ *S.* and steer **NE.** ½ **N.**, keeping the bearing. When Narraguagus Lighthouse bears *N.* by *E.* steer for it until the northern end of Jordans Delight bears *E.*, then steer **NNE.** ½ **E.** until the north end of Pond Island bears about *W.* by *N.*, taking care to give the shore of Pond Island a berth of 400 yards while eastward of the lighthouse. When the north end of Pond Island bears *W.* by *N.*, distant ⅝ mile, steer **NNE.** ½ **E.**, pass midway between Trafton and Tommy islands, and follow the directions in section 1 to pass eastward of Trafton Island.

Passing westward of Trafton Island.—Proceed as directed above until Narraguagus Lighthouse bears about *WSW.*, then change course to **N.** ¾ **W.** so as to pass about 300 yards southwestward of Trafton Island and follow the directions given in section 1, foregoing, for passing westward of Trafton Island.

To anchor in Douglas Island Harbor.—When, on the **N.** ¾ **W.** course in the preceding paragraph, Trafton Island has been approached to about ½ mile, steer **WNW.** and follow the directions given in section 1, foregoing, for anchorage in Douglas Island Harbor.

Remarks and dangers.—In thick weather the sound from the fog signal on Petit Manan is subject to aberration. In some instances, vessels comng from westward have been unable to hear it when close up to the island.

On the **NNE.** ⅞ **E.** and **NE.** ½ **N.** courses care must be taken not to be set off the sailing line by the current; the flood current has an easterly set and the ebb a westerly set. On the **NE.** ½ **N.** course **Shipstern Island** will show a little open eastward of Jordans Delight; the course, if made good, leads about midway between Jo Leighton Ground and Whale Ledge, and ¾ mile from the 15-foot spot on the former, and leads nearly ½ mile eastward of Jerrys Ledge. The southeastern end of Bois Bubert Island will be left about ¾ mile on the port hand.

Petit Manan Reef, making off nearly ½ mile southward of Petit Manan Island, is marked by a buoy (nun, red, No. 2) placed off its southern end, which should be given a berth of not less than 200 yards when passing inside the whistling buoy.

Simms Rock, Jackson Ledge, and **Tibbett Rock** are described under "Dangers," page 61.

Jo Leighton Ground has a small unmarked 15-foot rocky spot on it lying 2¼ miles **NE.** by **E.** ¼ **E.** from Petit Manan Lighthouse. The general depth over the shoal is 4½ to 7 fathoms.

Whale Ledge, bare at half tide, lies 1¾ miles **N.** by **E.** ¼ **E.** from Petit Manan Lighthouse, and about ¼ mile **S.** ¼ **W.** from Egg Rock, a low, rocky isle surrounded by ledges on all sides. A buoy (spar, red, No. 2) marks a 13-foot spot 300 yards southward of Whale Ledge.

Jerrys Ledge, marked by a black bell buoy, lies about ⅜ mile eastward of the southern end of Bois Bubert Island.

Jordans Delight Ledge lies southeastward of the island, with deep water between them; its northern end, bare at half tide and known as Black Ledge, is ⅝ mile **ESE.** from the southern end of Jordans Delight. The ledge extends in a broken line in a general **SSW.** ¼ **W.** direction for 1 mile to a small rock, bare at low water and marked by spindle, which lies a little over 1 mile **S.** ¼ **E.** from the southern end of Jordans Delight. A part of this ledge which does not show bare is usually marked by breakers.

The **N.** by **E.** course heading for Narraguagas Lighthouse leads about 300 yards westward of Jordans Delight. Jordans Delight is bold-to on its southern and western sides, but should be given a berth of at least 100 yards.

The **NNE.** ¼ **E.** course leads about 400 yards eastward of Narraguagus Lighthouse, 150 yards eastward of black spar buoy No. 1, and midway between Trafton and Tommy islands. Pond Island is bold-to southward of the lighthouse, but northward of the lighthouse the island should be given a berth of ¼ mile.

There is **a dangerous 9½-foot spot,** marked by a buoy (spar, black, No. 1), about 350 yards **NE.** by **E.** ¼ **E.** from Narraguagus Lighthouse, to avoid which the lighthouse should not be approached nearer than ¼ mile.

There is **a small rock** with 4 fathoms over it lying ⅝ mile **E.** from the northern end of Pond Island; this is not dangerous except for deep-draft vessels at low water or in a heavy sea.

For further description of dangers entering Narraguagus Bay or Douglas Island Harbor, see "Remarks and dangers" under section 1, foregoing.

PIGEON HILL BAY AND PETIT MANAN BAR.*

This bay, the entrance of which is also known as Bois Bubert Harbor, lies north of Petit Manan and west of Bois Bubert Island; it affords good anchorage in 12 to 24 feet of water, but is seldom used except by those well acquainted with the locality. **Petit Manan Bar** connects Petit Manan Island with Petit Manan Point on the mainland; it is composed of ledges and large bowlders, between which is a channel, marked by a buoy, which may be used by vessels of 8 feet draft at low water when the sea is smooth. The sea breaks along the whole length of the bar with a swell or in heavy weather and the tidal currents set over it with great velocity, the flood northeastward, the ebb southwestward; sailing vessels are cautioned not to approach the bar in a light breeze.

The approach to the entrance of Pigeon Hill Bay is eastward and northward of Petit Manan Island, between it and the ledges making southward from Bois Bubert Island. The dangers are not marked but can be avoided by closely following the directions.

There is a narrow channel (Eastern Passage) from Pigeon Hill Bay into Douglas Island Harbor and Narraguagus Bay; it leads north of Bois Bubert Island, between unmarked rocks and ledges, and is available at half tide only for small vessels with local knowledge. **Pigeon Hill,** the high, bare-topped hill on the western shore near the head of the bay, is conspicuous and a landmark for some distance at sea.

The **tides** are practically the same as at Trafton Island, Narraguagus Bay (see table, page 27).

SAILING DIRECTIONS, PIGEON HILL BAY.

1. ***Approaching and Entering, from Eastward.***—When 4½ miles eastward of Petit Manan Lighthouse bring it on any one of the following bearings, **W.** ¾ **S.,** or **W.** ½ **N.,** or **NW.** by **W.** ¾ **W.,** and steer for Petit Manan Lighthouse on any one of these bearings. Bring the lighthouse to bear *W.,* distant ½ mile, and steer **N.** ¾ **W.,** taking care not to be set westward by the ebb current; leave the red spar buoy marking Whale Ledge about 350 yards on the starboard hand. When the lighthouse is about 2 miles distant on the port quarter, and Petit Manan Point is nearly abeam, bring the lighthouse to bear *S.* ½ *W.* astern

*Shown on charts **102, 103,** scale $\frac{1}{80,000}$, price of each $0.50; **305,** scale $\frac{1}{40,000}$, price $0.25.

and steer **N. ½ E.**, keeping on the bearing. When abreast the southern end of Bois Bubert Island, follow a mid-channel course and anchor above the Gull Rocks in 4½ fathoms water, soft bottom.

Remarks.—On the **N. ¾ W.** course **Egg Rock**, small, bare islet surrounded by dark bowlders, will be a little on the starboard bow, and at half tide Whale Ledge will be seen southward of it.

The **N. ½ E.** course leads about ¼ mile westward of Egg Rock and directly for the highest point of Pigeon Hill. The upper part of the bay is usually obstructed by fish weirs, between which a narrow channel is left to pass through the Eastern Passage.

Dangers.—**Whale Ledge** is a small ledge, bare at half tide and usually breaking at high water; it lies a little over ¼ mile **S. ¼ W.** from Egg Rock. A spot with 13 feet of water over it, and marked by a buoy (spar, red, No. 2), lies about 300 yards southward of this ledge.

Egg Rock, at low water, shows as a large ledge of dark bowlders with several high parts which are always out of water; it lies 2¼ miles **N.** by **E. ¼ E.** from Petit Manan Lighthouse. There is a narrow channel between Egg Rock and Bois Bubert Island, but a stranger should not attempt it.

Rocks and **ledges** make off from the eastern shore of Petit Manan Point to about ½ mile of Egg Rock; these have from 7 to 16 feet of water over them. A spot with 3 feet over it lies nearly ⅜ mile off the shore and ¾ mile **NW. ½ W.** from the northern end of Egg Rock; the channel leads eastward of it.

Gull Rocks is a large ledge, bare at half tide, making off from the shore of Bois Bubert Island about 1⅜ miles **N.** of Egg Rock. These rocks are avoided by giving the shore of Bois Bubert Island a berth of ⅜ mile or keeping in mid-channel.

1A. ***Approaching and Entering, from Westward.***—Shape the course so as to pass about 1 mile **S.** of Petit Manan Lighthouse. From the whistling buoy steer so as to pass ½ mile eastward of the lighthouse, taking care not to be set westward on Petit Manan Reef by the ebb current. Bring Petit Manan Lighthouse to bear *W.*, distant ½ mile, and follow the directions in section 1, preceding.

See "Remarks" and "Dangers" under section 1, preceding.

DYERS BAY.*

This bay, the entrance to which lies **NNW. ½ W.** from Petit Manan Lighthouse, has excellent anchorage in 4 to 8 fathoms of water, but it is seldom used except by fishermen and small vessels owned in the vicinity. Petit Manan Point, on the eastern side of the bay, has a large standpipe which forms a prominent mark. The point is owned by a company, and is a summer resort. A group of islands, with narrow, deep passages between them, extend from westward across the entrance of Gouldsborough Bay, and part way across Dyers Bay entrance, leaving a good passage nearly ½ mile wide between the easternmost island, **The Castle**, and Petit Manan Point. One mile above The Castle the channel is contracted to a width of 250 yards by rocks and ledges, which extend out from both shores and have a depth of 9 to 11 feet over them. Above this the channel widens to ½ mile, and contracts gradually to ¼ mile westward of Sheep Island. The least water in the channel is 3¼ fathoms, but a stranger should not attempt to enter without a pilot, unless with a vessel drawing not more than 9 feet of water and in daylight.

Pinkham Bay, at the head of Dyers Bay, is full of rocks and ledges; a narrow, crooked channel with a depth of 8 feet at low water leads for some distance toward its head, which runs dry at low water.

Dyers Harbor, north of Sheep Island and west of Goods Point, is very shallow; the upper part is dry at low water.

Carrying Place Cove makes southeastward, north of Sheep Island; the head of this cove is nearly all dry at low water.

The **tides** are practically the same as at Prospect Harbor (see table, page 27).

The **tidal currents** are strong in the entrance of the bay, but follow the general direction of the channel except near Dyers Point, where they set in and out of Gouldsborough Bay; here great caution is necessary.

SAILING DIRECTIONS, DYERS BAY.

1. ***Approaching and Entering, from Eastward.***—When at the whistling buoy off Petit Manan Island steer **NNW. ½ W.**; as soon as the south end of Petit Manan Point is in range with Egg Rock, bearing *E.* by *N.*, steer **N. ¾ E.**, passing 250 yards eastward of

*Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **305**, scale $\frac{1}{40,000}$, price $0.25.

The Castle. When past The Castle haul westward; bring it to bear *S.* by *W.* ½ *W.* astern, and steer **N.** by **E.** ½ **E.**, passing up the middle of the bay. Anchor in 3¾ to 8 fathoms when 2 miles above The Castle and *SE.* of Parkers Head.

Remarks.—On the **NNW.** ½ **W.** course care should be taken not to be swept on Petit Manan Bar or Point by the flood current setting northeastward; the point should be given a berth of ¼ mile. The western shore of Petit Manan Point, from its southern end until nearly up to Yellow Birch Head, should be given a berth of 300 to 400 yards. **Yellow Birch Head** is the high, bare bluff on the eastern shore, about ¼ mile **NE.** ½ **N.** from The Castle.

On the **N.** by **E.** ½ **E.** course standing up the bay Sheep Island, which has a growth of tall trees, will be a little on the starboard bow.

1 A. ***Approaching and Entering, from Westward.***—When at the whistling buoy off Schoodic Island steer **NE.** by **E.** ⅝ **E.** for 7¼ miles; The Castle should then bear *N.* by *W.*, distant about ¼ mile. Then steer **N.** ¾ **E.**, passing 250 yards eastward of The Castle, and follow the directions in section 1, foregoing.

Remarks and dangers.—On the **NE.** by **E.** ⅝ **E.** course Schoodic Island should be given a berth of at least ¼ mile; **Old Woman, Old Man, Big Black,** and **Little Black ledges** will be left on the port hand. These ledges are bare at half tide, and the sea breaks on them at all times.

Little Black Ledge, the easternmost of the ledges, lying 3½ miles **NE.** by **E.** ⅝ **E.** from the southern end of Schoodic Island, will be left about ⅝ mile on the port hand.

Moulton Ledge, showing at low water and marked by a buoy (spar, red and black horizontal stripes), will be left about 1 mile on the starboard hand, and **Stone Horse Ledge,** with 11 feet on it, lying nearly ¼ mile **NE.** by **N.** from Moulton Ledge, will be left ¾ mile on the starboard hand. The course leads well southward of the islands off Gouldsborough and Dyers bays. As the western shore of Petit Manan Point is approached, Dyers Bay will be fairly opened out, and Yellow Birch Head on the eastern shore will show prominently.

GOULDSBOROUGH BAY*

lies **NW.** ½ **N.** from Petit Manan and about 1¾ miles northeastward of **Cranberry Point,** the eastern point at entrance to Prospect Harbor. This bay is about 4½ miles long in a **N.** and **S.** direction and 1 mile wide, and is an excellent anchorage with from 2 to 9 fathoms of water. A chain of small islands and ledges extends across the entrance; between them are two navigable channels known as **Eastern Way** and **Western Passage.** North of these islands there is a passage from the mouth of Dyers Bay, but it is too narrow and obstructed for a stranger to use. When approaching from westward great care must be taken not to mistake the passages, the islands being difficult to recognize. Inside the islands the bay is free from dangers and the water shoals gradually toward its head.

Indian Harbor is a small shallow cove on the western side of the entrance to Gouldsborough Bay; it is of no importance and can only be entered by small vessels well acquainted with the locality.

Joys Bay, a shallow body of water 1½ miles long, with a narrow, crooked channel to the village of Steuben, makes northward from Gouldsborough Bay at Rogers Point; it separates into two coves at its head; the eastern one is **Steuben Harbor** and the western **Joys Cove.**

Gouldsborough Harbor is a large shallow arm, with numerous ledges at its entrance, making into the northwestern part of Gouldsborough Bay and extending about 2½ miles to the village of Gouldsborough; it has a narrow, crooked channel, which is nearly dry at low water.

Steuben is a village at the head of Joys Bay; it can be reached at high water by vessels of 7 to 8 feet draft; it has telephone communication with Cherryfield.

Gouldsborough is a village at the head of Gouldsborough Harbor; it is of no commercial importance.

Channels.—The Eastern Way, or Ship Channel, leads into the bay between Eastern Island on the east and Bald Rock on the west; it is about 350 yards wide between the 18-foot curves and has a spot with 24 feet over it about 200 yards west of Eastern Island; this channel has the strongest tidal currents, and when the current is running ebb sailing vessels can enter only with a strong favorable breeze. **The Western Passage,** or Sloop Passage, leads into the bay between Sally Island on the east and Sheep Island on the west; it is about 200 yards wide between the 12-foot curves and leads close along the eastern side of Sheep Island; there is a spot with 18½ feet over it, about 110 yards east of Sheep Island; the tidal currents run true with the channel and have a velocity of 2 to

*Shown on charts **108**, scale $\frac{1}{80,000}$, price $0.50; **305**, scale $\frac{1}{40,000}$, price $0.25.

3 miles at strength. The channel inside the islands leads up the middle of the bay until up to Point Francis, above which the water shoals toward the eastern shore; it then leads straight from Point Francis to Garden Point, where it curves eastward around Rogers Point, and is narrow, crooked, and shallow in places up to the village of Steuben.

Anchorages.—Anchor anywhere in the bay from 1 mile above the islands to Point Francis in 3½ to 9 fathoms of water, giving the shores a berth of about 500 yards. There is a good anchorage in 16 feet of water about ⅛ mile **NNE.** from Point Francis.

Pilots can sometimes be found fishing on the ledges outside, but in clear weather strangers should be able to enter by the chart or sailing directions.

Supplies.—Provisions can be obtained at Gouldsborough or Steuben.

Ice obstructs navigation in the head of the bay from December to March. In severe winters the bay is closed by ice down to the entrance.

The **tides** are practically the same as at Prospect Harbor (see table, page 27).

SAILING DIRECTIONS, GOULDSBOROUGH BAY.

A depth of 4 fathoms can be carried into the bay through the Eastern Way, and 18 feet through the Western Passage. The tidal currents have a velocity of 2 to 3 miles at strength, through these passages.

1. ***Approaching and Entering through the Eastern Way, from Eastward.***—From the whistling buoy off Petit Manan steer **NNW. ¾ W.** a little over 4 miles. Continue nearly this course, passing midway between Eastern Island and Bald Rock. When inside the islands steer a little more northward and stand up the middle of the bay; the water shoals gradually toward Rogers Point. Anchor *NE.* from Point Francis, in 15 to 27 feet of water, soft bottom.

To Enter through the Western Passage.—From the whistling buoy off Petit Manan steer **NW. ⅝ N.** for the eastern side of Sheep Island. When about 100 yards distant from the eastern side of the island steer **N.** and stand up the middle of the bay. Anchor as directed above.

Remarks.—When standing for the entrance attention should be paid to the tidal currents which set across Petit Manan Bar with considerable velocity; the flood sets northeastward and ebb southwestward. There are no marked natural features to distinguish the different islands at the entrance of the bay. **Eastern Island** is the easternmost of these islands which have any trees; it is rocky, with ledges making off some distance from high-water mark; its western shore should be given a berth of about 125 yards.

When standing in, westward of Eastern Island, care should be taken not to be set too close to the islands by the tidal currents which, at strength, have considerable velocity between the islands, and set diagonally across the channel. The eastern end of Bald Rock should be given a berth of at least 125 yards.

Standing in through the Western Passage the best water is about 100 yards **E.** of Sheep Island. On the eastern side of this passage are extensive ledges which make westward from **Sally Island**, the island close westward of Bald Rock. After passing the northern end of Sheep Island the course leads up the middle of the bay. **Point Francis**, on its western shore, 3½ miles above the entrance, is high and wooded, showing prominently from the lower end of the bay.

Dangers.—The ledges off Petit Manan are described under sections 1 A, pages 61 and 64.

Moulton Ledge is about 350 yards in diameter, showing partly bare at low water; it lies 3 miles **WNW. ¼ W.** from Petit Manan Lighthouse, and is marked by a buoy (spar, red and black horizontal stripes) placed westward of the ledge. The buoy should be given a berth of at least ¼ mile. About ⅝ mile **S.** from Moulton Ledge is an unmarked spot with 18 feet over it.

Stone Horse Ledge (unmarked), with 11 feet over it, lies nearly 2⅞ miles **NW.** by **W. ½ W.** from Petit Manan Lighthouse, and ⅞ mile **NE.** by **N.** from Moulton Ledge.

Shoals make off southward and southwestward from Dyers Point; to avoid them give the point a berth of over 400 yards when northward of the islands.

Ledges, some showing bare at half tide, make out about 450 yards westward from Sally Island to the edge of the Western Passage.

Youngs Point Ledge makes off about 300 yards eastward from Youngs Point, the point northwestward of Sheep Island; the ledge has 6 feet over it near the eastern end, and is not marked.

1 A. ***Approaching and Entering through the Eastern Way, from Westward.***—From the whistling buoy off Schoodic Island steer **NE.** by **E.** ¾ **E.** about 4¼ miles until the end of Cranberry Point is in line with Prospect Harbor Lighthouse, then shape the course **NE.**, with the eastern end of Eastern Island ahead. When about ¼ mile distant from the island steer a little more northward for its western side, and when it is about 200 yards distant ahead steer **NNW.** ¾ **W.**, heading so as to leave the eastern side of Bald Rock about 200 yards on the port hand. When northward of Bald Rock stand up the middle of the bay and anchor as directed in section 1. (See also "Anchorages.")

To Enter through the Western Passage.—From the whistling buoy off Schoodic Island steer **NE.** by **E.** ¾ **E.**, and continue the course for ¾ mile after the end of Cranberry Point is in range with Prospect Harbor Lighthouse. Then steer **N.** by **E.**, and when the eastern end of Sheep Island bears about *N.* by *W.*, distant about ¼ mile, steer **N.**, passing about 100 yards eastward of the island; stand up the middle of the bay and anchor as directed in section 1, preceding.

Remarks and dangers.—On the **NE.** by **E.** ¾ **E.** course, the ledges off the entrance to Prospect Harbor are left well on the port hand; Little Black Ledge will be left nearly ½ mile distant when abeam; the end of Petit Manan Point will be a little on the starboard bow.

When the course is changed to **NE.**, the eastern end of Eastern Island should be ahead, and **Little Ledge** just eastward of Eastern Island, should be in range with Pigeon Hill; two small islands off the entrance to Dyers Bay will be a little on the starboard bow. Indian Harbor and the islands eastward will be broad off the port bow, and the passages between the islands into Gouldsborough Bay will be opened out. At low water many of the ledges around these islands show bare.

On the **N.** by **E.** course for the Western Passage, Sally Island will be on the starboard bow. When southward of Sheep Island give it a berth of at least 200 yards. Standing in through the Western Passage, Point Francis will be a little on the port bow. (See also Remarks under section 1, preceding.)

Moulton Ledge and **Stone Horse Ledge**, left on the starboard hand, are described under section 1.

Little Black Ledge and other ledges lying off the entrance to Prospect Harbor, left on the port hand, are described under section 1, "Sailing Directions, Prospect Harbor," page 70.

There is a **4-fathom spot** lying 1⅛ miles **SE.** by **E.** ½ **E.** from Cranberry Point.

The principal dangers in the Eastern Way and Western Passage are described under section 1, preceding.

PROSPECT HARBOR.*

This harbor lies **NNE.** ¾ **E.** from Schoodic Island and 6 miles **NW.** by **W.** ½ **W.** from Petit Manan Island. The outer harbor affords good anchorage, in all but southerly winds, for vessels of the deepest draft. Small vessels acquainted with the locality seek shelter in the inner harbor, anchoring in 10 to 20 feet of water inside Clark Point. The harbor is about 1½ miles long in a **N.** and **S.** direction, and has an average width of ¾ mile; near its head it is separated by Prospect Harbor Point into two coves, called Sand Cove and the Inner Harbor. **Prospect Harbor Lighthouse** (see table, page 16), the guide for entering the harbor, is on the southern end of Prospect Harbor Point.

Off the entrance to the harbor are several ledges which show bare or are marked by breakers at high water; the northwesternmost of these ledges is marked by a buoy.

Sand Cove is in the northern end of the harbor east of the lighthouse and is of no importance. **Inner Harbor** is the cove westward of the lighthouse; it is sheltered from all but southeast winds, but is small and only used by vessels well acquainted with the locality; the anchorage is in 10 to 20 feet, soft bottom.

Prospect Harbor, the village at the head of the Inner Harbor, is of little commercial importance.

Channels.—The ledges off the entrance divide the approach into two channels. The eastern channel passes north of the ledges and close to Cranberry Point; the western is buoyed and leads west of the ledges. The depth in the approach is from 9 to 20 fathoms and very irregular. The best anchorage is ¼ mile southwestward of the lighthouse, just inside of Clark Ledges spindle, in 4½ to 6½ fathoms water, soft bottom.

For **tides** see table, page 27.

*Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **305**, scale $\frac{1}{40,000}$, price $0.25.

SAILING DIRECTIONS, PROSPECT HARBOR.

1. *Approaching and Entering, from Eastward.*—Shape the course so as to bring Petit Manan Lighthouse to bear *N.*, distant $\frac{3}{4}$ mile, passing $\frac{1}{4}$ mile *N.* of the whistling buoy, and steer about **NW.** by **W.** so as to pass about $\frac{1}{4}$ mile southward of Cranberry Point. Keep a bright lookout for Moulton Ledge buoy, leaving it $\frac{1}{4}$ to $\frac{3}{8}$ mile on the port hand, and leave the bell buoy off Cranberry Point 50 yards on the starboard hand. When Prospect Harbor Lighthouse bears **N.** by **W.** $\frac{1}{2}$ **W.** steer for it and anchor when off Clark Point; or, haul northward and anchor in Sand Cove with the lighthouse bearing about *W.* by *S.*, distant $\frac{1}{4}$ mile.

To Anchor in the Inner Harbor.—Continue the **N.** by **W.** $\frac{1}{2}$ **W.** course until Clark Ledges spindle (black, wheel and pendant on top) bears *W.*, then steer **WNW.**, giving the spindle a berth of 100 to 200 yards, and anchor when about 300 yards westward of a line joining the spindle and lighthouse.

Remarks.—The **NW.** by **W.** course leads between Stone Horse Ledge and Moulton Ledge buoy (spar, red and black horizontal stripes); the latter should be left from $\frac{1}{4}$ to $\frac{3}{8}$ mile on the port hand. Cranberry Point bell buoy (red) should be made ahead.

Dangers.—**Moulton Ledge**, marked by a buoy (spar, red and black horizontal stripes), is a shoal spot, the center of which is bare at low water, lying about 3 miles **WNW.** $\frac{3}{4}$ **W.** from Petit Manan Lighthouse.

Stone Horse Ledge, an unmarked 11-foot spot, lies nearly $2\frac{1}{4}$ miles **NW.** by **W.** $\frac{1}{2}$ **W.** from Petit Manan Lighthouse and a little over $\frac{3}{4}$ mile **NE.** by **N.** from Moulton Ledge.

Little Black Ledge, Big Black Ledge, Old Man, and **Old Woman** are a succession of dangerous rocky ledges, mostly bare at low water, beginning at Little Black Ledge, about $2\frac{5}{8}$ miles **S.** by **E.** $\frac{5}{8}$ **E.** from Prospect Harbor Lighthouse, and extending in a general **WNW.** direction about 1 mile. The western end is marked by Old Woman Ledge buoy (spar, red, No. 2), lying about **SW.** from Old Woman and about 2 miles **S.** $\frac{1}{8}$ **W.** from Prospect Harbor Lighthouse. The **NW.** by **W.** course leads from $\frac{1}{4}$ to $\frac{3}{4}$ mile northward of these dangers.

The Inner Harbor is much obstructed by **rocks** and **shoals**; dangerous rocky ledges make out from 350 to 400 yards on both sides of the entrance. A black spindle, with wheel and pendant on top, and a buoy (spar, black, No. 3) mark the northeastern and eastern ends of the **ledges making out from Clark Point**, on the south side of the entrance to the Inner Harbor.

1A. *Approaching and Entering, from Westward.*—Shape the course so as to pass southward of the whistling buoy off Schoodic Island; bring the buoy to bear *W.*, distant about $\frac{1}{2}$ mile, and steer **NNE.** $\frac{1}{2}$ **E.**; pass midway between Bunker Harbor Ledges buoy (spar, black, No. 1) and Old Woman Ledge buoy (spar, red, No. 2), and stand into the harbor, giving the western shore a berth of about 600 yards. Anchor southward of the lighthouse in 7 to $8\frac{1}{2}$ fathoms water, soft bottom.

To Anchor in the Inner Harbor.—On the **NNE.** $\frac{1}{2}$ **E.** course, when Prospect Harbor Lighthouse bears **N.**, steer for it; leave black spar buoy No. 3 about 150 yards on the port hand, and when Clark Ledges spindle bears *WNW.* $\frac{1}{2}$ *W.* steer about **NW.** $\frac{1}{2}$ **W.** and anchor in $3\frac{1}{2}$ to 5 fathoms water about 400 yards northwestward of the spindle.

Remarks.—On the **NNE.** $\frac{1}{2}$ **E.** course Old Woman Ledge buoy (spar, red, No. 2) should be left about $\frac{3}{8}$ mile on starboard hand and Bunker Harbor Ledges buoy (spar, black, No. 1) the same distance on the port hand. The lighthouse will be on the port bow. On the **N.** course for the lighthouse, black spar buoy No. 3 and the spindle will be made on the port bow, and are left on the port hand.

Dangers.—The Old Woman and the Old Man ledges are described under section 1, foregoing.

Bunker Harbor Ledges, marked at its eastern end by a buoy (spar, black, No. 1), extends about $\frac{1}{4}$ mile eastward from the southern side of the entrance to Bunker Harbor.

For dangers entering the Inner Harbor see section 1, foregoing.

WINTER HARBOR.*

On the eastern side of Frenchman Bay, between Schoodic Peninsula and Grindstone Neck, is an excellent harbor of refuge with good anchorage in 4 to 9 fathoms of water and good holding ground; it is comparatively

*Shown on chart **103**, scale $\frac{1}{80,000}$, price $0.50; **306**, scale $\frac{1}{40,000}$, price $0.25; **317**, scale $\frac{1}{20,000}$, price $0.20.

free from dangers, and although open southward a heavy sea never enters. Coasting vessels frequently seek refuge here. **Winter Harbor Lighthouse** (see table, page 16) is the guide for entering; buoys and spindles mark the principal dangers so that a pilot is not required if the directions are closely followed. The village of **Winter Harbor** at its head has steamboat communication with Bar Harbor in summer; it is of little commercial importance; there is 8 feet at low water alongside the wharf. **Sand Cove,** in the northwestern part of the harbor, is the usual and best anchorage. **Grindstone Neck,** on the western side of the harbor, has a number of large cottages, and is owned by a company which has two large club houses, a boat landing, and wharf on the west shore of Sand Cove. **Ice** seldom forms sufficiently to interfere with navigation. For **tides** see table, page 27.

SAILING DIRECTIONS, WINTER HARBOR.

These directions are good for vessels of the deepest draft. Anchorage in 5 to 7 fathoms of water will be found in Sand Cove and in 8 to 9 fathoms water in the middle of the harbor.

1. ***Approaching and Entering, from Eastward or Southward.***—From the whistling buoy off Schoodic Island steer **NW. ⅝ W.** When Winter Harbor Lighthouse bears between **N. ½ W.** and **NE. ½ N.** steer for it; pass 300 yards eastward of the lighthouse and steer about **N.** by **E. ½ E.** When about 1 mile above the lighthouse steer more northward; follow the western shore and anchor in the middle of Sand Cove, about ¼ mile from its head. Or, anchor in the middle of the harbor south of Harbor Point, in 8 fathoms of water.

Remarks.—Heading for Winter Harbor Lighthouse, **Turtle Island,** large, partly wooded, will be on the port bow, and its southern end should be given a berth of 300 yards; **Turtle Island Ledge,** bare at half tide, makes out ⅜ mile from the southwest side of Turtle Island. The entrance to the harbor is eastward of the lighthouse. On the **N.** by **E. ½ E.** course Sand Cove will be a little on the port bow, and **Harbor Point,** low, wooded, the eastern point at entrance to Sand Cove, will be ahead. The head of Sand Cove is dry at low water. Light-draft local vessels usually anchor in **Winter Harbor Cove,** the small, shallow cove northward of Harbor Point.

Dangers.—**Grindstone Ledge** makes out about ¼ mile southward from Grindstone Neck; it is bare at half tide, and marked off its southern end by a buoy (nun, red, No. 2), and a spindle (iron, black, cage on top) on the middle of the ledge; these are left well on the port hand standing into the harbor.

Abijah Ledge, bare at extreme low water, makes out from the eastern shore of the harbor about 1½ miles above the lighthouse; it is marked off its western end by a buoy (spar, red, No. 4).

The ledge making southward 150 yards from the end of Harbor Point is marked on its southeastern side by a buoy (can, black, No. 1).

1 A. ***Approaching and Entering, from Westward.***—Having come from Southwest Harbor, from a position north or south of East Bunker Ledge, steer **ENE. ¾ E.** until Winter Harbor Lighthouse bears northward of **NE. ½ N.**; then steer for the lighthouse and follow the directions in section 1, preceding.

Or, from the Whistling Buoy off Baker Island.—Steer **NE. ¼ E.** until Winter Harbor Lighthouse bears **NNE.** when steer for it; pass eastward of the lighthouse and follow the directions in section 1, preceding.

Remarks.—Standing for the entrance to Winter Harbor from westward, **Schoodic Mountain,** the highest point on Schoodic Peninsula, should be on the starboard bow. The western shore of the peninsula is bold-to, and can be approached to 150 yards until well inside the harbor. The southwestern side of Turtle Island must not be approached closer than 650 yards. See dangers under section 1, preceding.

FRENCHMAN BAY.*

This large bay, with its harbors and tributaries, lies westward of Schoodic Peninsula and eastward of Mount Desert Island; the bay proper is about 10½ miles long in a **N.** and **S.** direction, and has an average width of about 5 miles. Halfway toward its head is a group of islands extending **E.** and **W.** across the bay, between which are two good channels leading to the upper part.

*Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **306**, scale, $\frac{1}{40,000}$, price $0.25.

Vessels of the largest size and deepest draft can find an anchorage. The principal guides to the bay from seaward are Mount Desert (Rock), Baker Island, Egg Rock, and Winter Harbor lighthouses (see table of lights, page 16). **Green Mountain,** the highest point of Mount Desert Island, is 1,532 feet above the sea, and is visible in clear weather between 35 and 45 miles. **Mount Desert** (Rock) **Lighthouse** is 20 miles **S.** by **W. ½ W.** from the entrance and should be sighted, if possible, when approaching from seaward. Four miles **SSW.** from the western point at the entrance is **Baker Island Lighthouse; Egg Rock Lighthouse,** a short distance above and midway in the entrance, is the guide into and up the bay. Winter Harbor Lighthouse, in the entrance of Winter Harbor, is on the eastern side of the bay; it is of no use to vessels above the entrance. The navigation of the bay is not difficult to strangers with the assistance of a chart or sailing directions. Some of the harbors in the upper part of the bay, however, should not be entered without a pilot. Steamers ply between the landings on the bay and its tributaries.

During the winter navigation is practically closed by ice above the Porcupine Islands. Winter Harbor is the only harbor of refuge at that season. (See page 70.)

BAR HARBOR

is a town and anchorage on the eastern side of Mount Desert Island, about 5¼ miles northward of Otter Creek Point, and 3¼ miles **NW.** by **N.** from Egg Rock Lighthouse. This harbor is formed by an indentation in the shore of Mount Desert Island and two islands to the northward; a breakwater (not completed) extending southwesterly from Round Porcupine Island affords some shelter against southerly winds. The bottom is generally rocky and poor holding ground except near the head of the harbor, and the water deepens quickly from 4 to 13 fathoms. A swell heaves in during southeast winds, and vessels should not attempt to ride out a gale here from that direction. The nearest good anchorage is Stave Island Harbor. There is 10 to 13 feet alongside the steamboat wharves at low water.

The Harbor Master attends to keeping a clear channel for steamers to the wharves, and has buoys placed to mark the limits within which vessels are not to anchor. Coal, either anthracite or bituminous, can be had in limited quantities at the wharf or from lighters; water can be had alongside the steamboat wharf or from water boats. Provisions can be obtained in the town.

STAVE ISLAND HARBOR

is an excellent harbor of refuge on the eastern shore of the bay, formed by the mainland on the east, Stave Island on the north, and Jordans Island on the south; the anchorage has a depth of 3½ to 6 fathoms, soft bottom, and is sheltered from all winds. The principal entrance, and the one used by strangers, is between Stave and Jordans islands, but vessels well acquainted with the locality sometimes cross Jordans Bar, which extends from Jordans Island to the mainland. Vessels bound to West Gouldsborough, or other towns at the head of the bay, sometimes call here for pilots, who can generally be found by inquiry on shore. A stranger does not need a pilot to enter this harbor, attention to the directions or the chart being all that is necessary.

FLANDERS BAY,

in the northeastern part of Frenchman Bay, north of Stave and Calf islands, is an excellent anchorage but of no importance except as an approach to **West Gouldsborough** and **East Sullivan,** the former lying at the head of a shallow cove in the eastern part, and the latter at the head of **Bass Cove** in the northern part. There are two entrances to Flanders Bay; one across Calf Island Bar between Stave and Calf islands, and the other between Calf and Preble islands; the latter has the better water, but takes a vessel some distance out of a direct course to either of the villages. Strangers bound to West Gouldsborough or East Sullivan are advised to take a pilot in Stave Island Harbor. It is only at high water that vessels can get to these villages; 10 feet is the deepest draft entering; the wharves are dry at low water.

SULLIVAN HARBOR (SULLIVAN RIVER)

is an arm of Frenchman Bay making northward from its northern end, and lies between Waukeag Neck on the east and Crabtree Neck on the west. **Sorrento,** a popular summer resort, and **Sorrento Harbor,** a small anchorage between Preble Island and the southwestern end of Waukeag Neck, are on the east side of the entrance. The mouth of Sullivan Harbor is obstructed by Bean Island and the surrounding shoal water, but a deep channel nearly ⅜ mile wide leads on the western side between it and Crabtree Ledge, which is marked by **Crabtree Ledge Lighthouse** (see table, page 16), the principal guide for the entrance to the harbor. Above this the channel has a number of well-marked ledges on either hand, and is about ¼ mile wide up to the town of **Sullivan,**

where it turns sharply **NW.** through the narrows and nearly 2 miles farther in Sullivan River to **Taunton Bay**, which, with the exception of a very narrow, crooked channel, is almost dry at low water. The town of **Franklin** is at the head of this bay. There is a narrow buoyed channel east of Bean Island, but strangers should not use it.

About ¼ mile above Sullivan, and for a distance of about 300 yards, the narrows are so contracted and obstructed by ledges that the tidal current forms dangerous rapids known as **Sullivan Falls.** Vessels of 11 feet draft may pass up at low water slack, which occurs after a rise of 2 feet in the tide below the narrows. Vessels coming out must pass at slack water; after the ebb begins to run the falls are not safe. The rise and fall of tide is 4 feet less above the falls than below. High water slack is 1 hour 18 minutes later and low water slack 1 hour 45 minutes later in the falls than below them.

The towns of Sullivan and Franklin are places of little commercial importance. Strangers going above the falls should take a pilot, and sailing vessels generally take a tug; they may be found at Sullivan. Halfway from Crabtree Point to Sullivan, on the western shore of the harbor, is **Mount Desert Ferry**, a terminus of the Maine Central Railroad; it has frequent steamer communication with Bar Harbor. Ice obstructs navigation during January, February, and March.

SKILLINGS RIVER

empties into the northern part of Frenchman Bay just westward of Sullivan Harbor; the entrance is between Crabtree Point on the east and Meadow Point on the west, where it is 1⅝ miles wide, but it contracts rapidly, and 1¾ miles above Crabtree Point is only 400 yards wide. Above this the river leads about 4 miles in a northwesterly direction to the post village of **North Hancock.** The channel is narrow and crooked and has numerous rocks and ledges, making its navigation difficult. Strangers wishing to enter the river should get a pilot at Bar Harbor, or anchor 1¼ miles above Crabtree Point in 5 to 7 fathoms water and get a pilot from South Hancock. **South Hancock** is a village on the east bank 2¼ miles above Crabtree Point; 14 feet is the deepest draft trading here and 9 feet the usual draft; there is 3 feet at low water at the wharves; 19 feet can be found in the channel at low water. There is a narrow anchorage in the channel abreast of the village in 4 to 7 fathoms water.

The town of **Hancock** is near the head of a large shallow cove called Youngs Bay, about 1¼ miles above South Hancock, on the eastern bank of the river; it has little trade. Vessels going there lie aground at low water.

North Hancock is a small village at the head of the river on **Kilkenny Cove**; this cove is shallow and has a narrow channel leading through it; vessels of 9 feet draft have been taken up at high water.

EASTERN BAY, MOUNT DESERT NARROWS, AND JORDANS RIVER.

These waters lie north of Mount Desert Island, Eastern Bay and Mount Desert Narrows separating the island from the mainland. **Eastern Bay** is the name given to a short reach westward of the entrance to Skillings River: it has good water and the dangers are marked by buoys; it is about 1 mile wide. The **U. S. Naval Coaling Station** is on the north shore of the bay, **E. ¾ N.** from Hadleys Point. At Hadleys Point, Eastern Bay merges into **Mount Desert Narrows**, and **Berrys Cove** makes into the northern shore. There is a good anchorage with 18 to 24 feet off the entrance to this cove, which is shallow at its head. Westward of Hadleys Point the channel of Mount Desert Narrows contracts, and shoals make out from the shores on both sides; 2¼ miles above this point a drawbridge crosses the narrows from Mount Desert Island to the mainland. At low water the island and mainland are connected by extensive flats. A stranger should not pass westward of Hadleys Point without a pilot.

Jordans River, making northward, just west of Berrys Cove, has a narrow, crooked channel with 5 feet at low water up to Lamoine. Strangers should take a pilot at Berrys Cove (**East Lamoine**); the channel is not marked so as to be followed, except by persons well acquainted with the locality. **Lamoine** is a town on the east bank of the river just above the entrance; a draft of 15 feet can be taken up to it; the usual draft is 10 feet; the wharves are dry at low water. Water can be had at the wharves through hose; provisions can be obtained in the town.

Salisbury Cove, on the south side of Eastern Bay, is nearly dry at low water near its head, but there is good anchorage in 6 to 8 fathoms between it and Googin Ledge buoys.

Tidal currents.—In Mount Desert Narrows the flood current sets westward and ebb eastward.

For **tides** see table, page 27.

SAILING DIRECTIONS, FRENCHMAN BAY.

The following directions are good for vessels of the deepest draft into Bar Harbor, Sullivan Harbor, Skillings River Entrance, and Eastern Bay.

1. ***Approaching and Entering, from Eastward.***—From the whistling buoy off Schoodic Island steer **NW. ¼ W.** about 3¼ miles. When Winter Harbor Lighthouse is in line with the southern end of Turtle Island change the course to **NNW. ½ W.**; pass ½ mile northward of Egg Rock and the same distance south of Iron Bound Island. Round Porcupine Island should be left ¼ mile on the port hand. When the southern side of Round Porcupine Island is in range with the southern point at entrance to Rodick Cove, bearing about *WSW. ¼ W.*, if bound to any of the harbors in the bay, follow the directions in sections 2 to 2 E, according to destination.

Remarks.—On the **NW. ¼ W.** course from the whistling buoy off Schoodic Island, Egg Rock Lighthouse will be made ahead—the course leads ¼ mile south of the southwestern point of Schoodic Peninsula. **Winter Harbor** will be opened and Winter Harbor Lighthouse will be seen on the western side of the entrance.

On the **NNW. ¼ W.** course **Iron Bound Island**, dark, high, bluff faces, wooded on top, will be on the starboard bow and left ¼ mile on the starboard hand. **Round Porcupine Island**, a rocky island 190 feet high with rounded top, will be a little on the port bow. **Sheep Porcupine Island** will be a little on the port bow to the right and northward of Round Porcupine Island. **Burnt** and **Long Porcupine islands** will be made on the starboard bow eastward of Sheep Porcupine Island. The entrance to Bar Harbor is between Round and Sheep Porcupine islands, and to Stave Island Harbor northeastward of Long Porcupine Island.

Dangers.—**Turtle Island Ledge**, bare at half tide, makes out ⅜ mile southwestward from the southwestern side of Turtle Island.

Handiron Ledge, bare in spots, makes out 300 yards in a northerly and northeasterly direction from Egg Rock. The northern and eastern sides of Egg Rock should be given a berth of about ¼ mile.

1A. ***Approaching and Entering, from Southward.***—From Mount Desert Rock steer **N.** by **E. ½ E.** about 16¼ miles. Baker Island Lighthouse should then bear abeam, *WNW. ½ W.*, distant about 3 miles, and Egg Rock Lighthouse should bear *N.* by *E. ¼ E.*, distant about 6¾ miles. Then steer **N. ½ E.** for 9 miles, heading for Burnt Porcupine Island until the south end of Round Porcupine Island and the south point at entrance to Rodick Cove are in range, bearing *WSW. ¼ W.* Then follow the directions in sections 2 to 2 E, according to destination.

Or, from the whistling buoy 1½ miles SSE. ¼ E. from Baker Island Lighthouse, steer **NNE. ¾ E.** about 6¾ miles heading for Egg Rock Lighthouse until up to Egg Rock whistling buoy, and Schooner Head is abeam. Then steer **N. ½ W.** a little over 3¼ miles, keeping the western end of Burnt Porcupine Island a very little on the starboard bow until Round Porcupine Island is ¼ mile distant and its southern side bears *WSW. ½ W.* Then , if bound to any of the harbors in the bay, follow the directions in sections 2 to 2 E, according to destination.

Remarks.—On the **N.** by **E. ½ E.** course from Mount Desert Rock, Green Mountain, the highest point of Mount Desert Island, will be on the port bow. **Great** and **Little Duck islands**, about 12 miles **N. ¾ W.** from Mount Desert Rock, will be left about 5 miles on the port hand. Baker Island and Lighthouse will be made on the port bow and are left about 3 miles on the port hand when passing. Winter Harbor Lighthouse will be made on the starboard bow, and Egg Rock Lighthouse will be made ahead; the course should be changed so as to pass 1 mile westward of Egg Rock.

On the **N. ½ E.** course Burnt Porcupine Island will be ahead, and the buoy off Schooner Ledge, and The Thrumbcap should be left nearly ½ mile on the port hand.

Dangers.—**A ledge**, showing partly bare at half tide, extends ¼ mile southwestward from Egg Rock. A whistling buoy (red, "E. R.") is placed nearly ⅝ mile **SSW.** from the end of the ledge, and 1 mile **SSW. ⅝ W.** from Egg Rock Lighthouse. To avoid the ledge give the southwestern end of Egg Rock a berth of ⅝ mile.

The dangers along the eastern shore of Mount Desert Island can be avoided by giving that shore a berth of ⅛ mile.

1 B. ***Approaching and Entering, from Westward, North of Cranberry Islands.***—Passing north of East Bunker Ledge, when Lewis Rock buoy (spar, black, No. 3) is 150 yards on the starboard beam, steer **ENE.** $\frac{3}{4}$ **E.** a little over $2\frac{1}{4}$ miles, following the shore of Mount Desert Island at a distance of 600 yards. When Otter Cliff Ledge buoy (bell, black) bears *NNW.*, distant 400 yards, steer **NE.** $\frac{1}{4}$ **N.** for 2 miles, and when Schooner Head buoy (can, black, No. 3) bears *W.*, distant $\frac{3}{8}$ mile, steer **N.** $\frac{1}{2}$ **E.** for $3\frac{1}{4}$ miles until the southern end of Round Porcupine Island bears *WSW.* $\frac{1}{4}$ *W.* Then, if bound to any of the harbors in the bay, follow the directions in sections 2 to 2 E, according to destination.

Or, from a position about $\frac{1}{4}$ *mile south of East Bunker Ledge beacon*, steer **NE.** by **E.** $\frac{1}{2}$ **E.**, passing about $\frac{3}{8}$ mile southeastward of Otter Creek Point. When the bell buoy off Otter Cliff Ledge bears *NNW.*, distant 400 yards, steer **NE.** $\frac{1}{4}$ **N.** and follow the directions in the preceding paragraph.

Remarks.—Although the southeastern and eastern shores of Mount Desert Island are generally bold-to it is advisable to give them a berth of about $\frac{3}{8}$ mile to avoid several ledges which lie off the shore between Otter Creek Point and Schooner Head.

On the **NE.** $\frac{1}{4}$ **N.** course the eastern side of Iron Bound Island will be ahead, and Great Head will be left 700 yards on the port hand.

On the **N.** $\frac{1}{2}$ **E.** course Burnt Porcupine Island will be ahead, and **The Thrumbcap**, a small, bare, rocky islet, will be left about $\frac{3}{8}$ mile on the port hand. Strangers should not pass between The Thrumbcap and Mount Desert Island.

Dangers.—**Otter Cliff Ledge**, showing bare at low water, lies about 400 yards eastward of Otter Creek Point. A black bell buoy is placed about 250 yards southeastward of the ledge.

Schooner Ledge, bare at low water, lies about 350 yards from the shore and about midway between Great Head and Schooner Head; a buoy (can, black, No. 3) is placed about 300 yards eastward of the ledge.

The ledge extending $\frac{1}{4}$ mile southwestward from Egg Rock is described under section 1 A, preceding.

2. ***To Enter Bar Harbor.***—Having followed the directions in section 1, 1 A, or 1 B, when the south end of Round Porcupine Island is in range with the southern point at entrance to Rodick Cove and the eastern end of the island is $\frac{1}{4}$ mile distant on the port beam, steer **NW.** $\frac{3}{4}$ **W.**, and anchor in 4 to 10 fathoms before the eastern end of Bar Island bears *N.*

Note.—There is a narrow channel between the end of the breakwater, making off from Round Porcupine Island, and the shore of Mount Desert Island. To pass through this channel pass 75 yards westward of the red spar buoy marking the end of the breakwater, and give the shore of Mount Desert Island northward of the breakwater a berth of 300 yards or more.

Remarks.—Standing in to the anchorage the water will shoal rapidly, and attention should be paid to the anchorage buoys.

2 A. ***To Enter Stave Island Harbor.***—Having come from eastward and followed the directions in section 1 until the southern end of Iron Bound Island is in range with the highest point of Grindstone Neck, bearing about *E.* by *S.*, steer **N.** by **E.** $\frac{1}{4}$ **E.** for the eastern end of Long Porcupine Island. When the northern end of Round Porcupine Island bears *W.* steer **NE.** $\frac{5}{8}$ **N.**, so as to pass at least 300 yards westward of Yellow Island. Round the island, giving it a berth of 300 yards, and steer about **E.**; anchor anywhere southeast of the southern end of Stave Island, in from $5\frac{1}{2}$ to 7 fathoms water, soft bottom. There is a small shoal with 7 feet of water over it in the southeastern part of the harbor.

Or, having come from southward or westward, and followed the directions in section 1 A or 1 B, until The Thrumbcap bears *W.* distant about $\frac{1}{2}$ to $\frac{5}{8}$ mile, steer about **NE.** by **N.** Leave Iron Bound Island and Yellow Island at least 300 yards on the starboard hand, and follow the directions in the preceding paragraph.

Remarks.—The northern side of Egg Rock should be given a berth of nearly ¼ mile. Iron Bound Island is bold-to and can be approached as close as 150 yards. When standing for the entrance to Stave Island Harbor, **Yellow Island**, a rocky islet, covered with trees, off the northwestern point of Jordans Island, will be on the starboard bow. **Halibut Hole**, the passage between Iron Bound Island and Jordans Island, has good water, with the exception of one small spot with 17 feet over it. **Jordans Bar**, extending from the southeastern point of Jordans Island to the mainland, usually has a fish weir on it and has a narrow channel, with 8 feet of water, which is not used except by small local vessels.

2 B. ***To Enter Flanders Bay, between Stave Island and Calf Island.***—Having followed the directions in section 1, 1 A, or 1 B, from a position ¼ mile *E.* of Round Porcupine Island, steer **N.** by **W.** ½ **W.**, passing about midway between Burnt Porcupine Island on the east and Sheep Porcupine Island on the west. As soon as the steamboat wharf at Bar Harbor can be seen showing westward of Sheep Porcupine Island, steer **NE.** by **E.** a little over 3 miles for Calf Island Bar. The buoys marking the channel, when sighted on this course, will appear nearly in line, and very near together; the first one (spar, black, No. 1) leave close aboard on the port hand; then haul a little northward and leave the next one (spar, red, No. 2) on the starboard hand; then steer **E.** by **N.** Half Tide Ledge buoy (spar, black, No. 3) will be in sight nearly ahead; leave it on the port hand and change course to **N.** ½ **E.** and steer for Halls Point; when about ¼ mile from it anchor in about 6 fathoms.

Or, when Halls Point is a little over ¼ mile distant ahead, steer **NW.** ¾ **N.**, pass midway between Halls Point and black spar buoy No. 5, and follow the shore of Ash Neck at a distance of 300 yards; anchor 600 yards *NW.* by *W.* from Ash Point in 4 fathoms.

Remarks.—Vessels approaching the entrance should leave **Thrumbcap**, a small islet covered with trees, lying south of Calf Island, at least ¼ mile on the port hand, to clear the ledge which extends nearly 400 yards southeastward from it. When abreast of Thrumbcap the buoys marking the channel, which is narrow, will be seen northeastward. Do not attempt to carry more than 9 feet draft over the bar at low water; the channel is narrow.

There is a clear and deep channel which leads into Flanders Bay between Preble and Calf islands, and around the northern end of the latter. To enter by this channel, follow the shore of Calf Island, giving it a berth of 200 yards. Vessels entering with a southerly wind are liable to be becalmed under the north end of Calf Island.

Eastern Point Harbor is a well-protected anchorage for small craft north of the east end of Preble Island, between it and Waukeag Neck. The head of this harbor is shallow.

2 C. ***To an Anchorage in Sullivan Harbor.***—Having followed the directions in section 1, 1 A, or 1 B, to a position ¼ mile *E.* from Round Porcupine Island, steer **N.** by **W.** ½ **W.** and pass midway between Burnt Porcupine and Sheep Porcupine islands. When about ⅜ mile northward of the islands steer **N.** ⅛ **E.**, heading between Bean Island on the east and Crabtree Ledge Lighthouse on the west. Pass eastward of Crabtree Ledge Lighthouse; bring it to bear *SSW.* ⅞ *W.* and steer **NNE.** ⅞ **E.**; on this course leave Ingalls Ledge buoy (nun, red, No. 6) on the starboard hand and pass about midway between the two spindles above Mount Desert Ferry. When between the spindles, steer **NE.** ½ **N.** until up to Moon Ledge buoy (can, black, No. 1), which is left 125 yards on the port hand; then haul a little more northward and anchor, favoring the northern shore, in 3½ to 7 fathoms water off the town of Sullivan.

If bound through the Narrows, take a pilot.

Remarks and dangers.—On the **N.** ⅛ **E.** course no dangers are encountered until up to Crabtree Ledge Lighthouse, which should be left at least 100 yards on the port hand. The western end of Bean Island should be given a berth of over 200 yards. The shoals making northward from Bean Island are avoided by favoring the western shore. The wharf and buildings at Mount Desert Ferry show prominently. When above Mount Desert Ferry the channel leads straight until past Moon Ledge buoy, where it turns westward. The water shoals abruptly on both sides of the channel.

2 D. ***To an Anchorage in Skillings River.***—Having followed the directions in section 1, 1 A, or 1 B, from a position ¼ mile eastward of Round Porcupine Island, steer **N.** by **W.** ½ **W.**; pass midway between Burnt Porcupine and Sheep Porcupine

islands; leave Bald Rock Ledge buoy (spar, black, No. 5) about ¼ mile on the port hand and stand into the entrance of the river between Crabtree Point on the east and Meadow Point on the west. Continue about 1½ miles above Crabtree Point and anchor in the channel in 6 to 8 fathoms. If bound farther up the river, a pilot should be obtained from South Hancock.

Remarks.—On the **N.** by **W.** ½ **W.** course Crabtree Neck will be a little on the starboard bow; the course leads about ⅝ mile eastward of **Bald Rock,** a bare rock at the eastern end of Bald Rock Ledge. The western shore of Crabtree Neck is bold-to and can be approached as close as 150 yards, with 6 to 10 fathoms water.

2 E. ***To an Anchorage in Eastern Bay, or, if bound to Jordans River.***—Having followed the directions in section 1, 1 A, or 1 B, from a position ¼ mile *E.* of Round Porcupine Island, steer **N.** by **W.** ½ **W.**, midway between Burnt and Sheep Porcupine islands, and when 1⅝ miles northward of them leave Bald Rock Ledge buoy (spar, black, No. 5) about ¼ mile on the port hand. When Bald Rock bears *SW.* steer **NW.** ¼ **N.**, and, having stood on this course about 2 miles, leave Sunken Ledge buoy (spar, black, No. 9) a little over ¼ mile on the port hand. Then haul westward, course about **WNW.** ⅝ **W.**, and follow the shore of Mount Desert Island, giving it a berth of ¼ mile. When abreast Googin Ledge buoys and off Salisbury Cove anchor in 5½ to 10 fathoms water, soft bottom. If bound to Jordans River, take a pilot at Salisbury Cove or East Lamoine.

Remarks.—On the **N.** by **W.** ½ **W.** course **Bald Rock,** small, bare, rocky islet, will be left ⅝ mile on the port hand. On the **NW.** ¼ **N.** course, **Meadow Point,** the western point at entrance to Skillings River, will be a little on the starboard bow. After passing Sunken Ledge buoy and standing into Eastern Bay, Googin Ledge and the three red spar buoys marking its southern and western ends should be ahead and gradually brought to bear on the starboard bow. **Salisbury Cove** and **Emerys Cove** are two small, shallow bights in the south shore southward of Googin Ledge. The anchorage off Salisbury Cove is good for vessels of the deepest draft. The Naval Coaling Station northwestward of Googin Ledge is a prominent feature on the north shore of Eastern Bay. The two red spar buoys westward of the coaling station mark the edge of the 5-fathom curve off Berrys Cove; a **rock** with 4½ fathoms over it is reported as lying southward of the buoys and nearly ½ mile **ENE.** from Hadleys Point.

SOUTH SHORE OF MOUNT DESERT ISLAND.*

Newport Cove is a small cove making northward west of Great Head; it is not a good anchorage, being exposed southward, and the holding ground is poor.

Otter Cove is a long, narrow cove making northward west of Otter Creek Point; it is shallow at its head and is an exposed anchorage.

Seal Harbor makes in to the south shore of Mount Desert Island about 1⅝ miles east of Bear Island; it is an anchorage for small vessels, but is exposed to southeasterly winds. There is a steamboat landing and the village of Seal Harbor, a summer resort, on the eastern shore. A black spar buoy marks the end of the ledge, which extends from the western shore halfway across the entrance of the harbor.

Bracys Cove, westward of Seal Harbor, is unfit for an anchorage.

Northeast Harbor and Somes Sound are described under their respective headings.

Baker Island and the **Cranberry Islands** lie from 1½ to 3 miles south of Mount Desert Island, the waters north of them forming the eastern approach to Somes Sound and Southwest Harbor. They are of no commercial importance. **Baker Island,** the southeasternmost of the group, is marked by **Baker Island Lighthouse** (see table, page 16), and on the southeastern point of Little Cranberry Island is a **life-saving station.**

Cranberry (Islesford) Harbor is on the northern side of the islands between Little Cranberry and Great Cranberry islands; it is frequented by small local vessels, and coasting vessels sometimes anchor here, but Southwest Harbor is a much better anchorage. The post village of **Islesford** is on the east side of the harbor, and the usual anchorage is in 14 to 20 feet of water in the middle of the harbor with the wharves bearing about **ENE.**, taking care to keep well clear of the black spar buoy on the ledge at the east side of the entrance.

Great Cranberry Island, the westernmost of the group, is about ⅝ mile from the shore of Mount Desert Island; on its western side is a narrow channel (**Cranberry Island Passage**) with a depth of 14 feet, forming the southern and western approach to Somes Sound and Southwest Harbor.

*Shown on charts **103,** scale $\frac{1}{80,000}$, price $0.50; **306, 307, 308, 292,** scale of each $\frac{1}{40,000}$, price of each $0.25.

The **Gott Islands** lie about ¼ mile south of Bass Harbor Head; a bar with a greatest depth of 12 feet over it at low water extends from Great Gotts Island, the northernmost of the two, to Bass Harbor Head. The best water is nearer Bass Harbor Head.

Great and **Little Duck Islands** lie from 3½ to 5 miles southward of Great Cranberry Island and have deep water all around them; they should be given a berth of ¼ mile. On the southern end of Great Duck Island is the lighthouse and fog signal (see table, page 16).

Black Island is a large island about ⅝ mile southward of Little Gotts Island; it has a large granite quarry near the north end of the island. There is broken ground with a least depth of 14 feet in the middle of the passage between Black Island and Green Islands.

Placentia Island lies about ⅝ mile westward of Little Gotts Island. A channel leads between these islands, but a stranger should not use it unless obliged to, as there are spots with as little as 20 feet over them.

SOUTHWEST HARBOR*

This is the most important harbor on the south side of Mount Desert Island; it has an excellent, well-sheltered anchorage in 12 to 36 feet of water, and can be entered from eastward by vessels of the deepest draft. There are two approaches, the one from eastward leading between the south shore of Mount Desert Island and the Cranberry islands, and the one from southward leading between the shore of Mount Desert Island and the west shore of Great Cranberry Island over Cranberry Island Bar. Somes Sound makes northward from Greenings Island, which lies on the north side of the entrance to Southwest Harbor. The village of **Southwest Harbor** is one of the summer resorts on Mount Desert Island, and several large hotels are situated near the shores of the harbor. It has telegraphic and telephone communication with the mainland, and the steamboats of several lines stop here. The steamboat wharf on the north shore has 9 feet at low water, and the wharves on the south shore have from 5 to 7 feet of water at their ends.

Prominent objects.—Approaching from eastward **Baker Island Lighthouse** (see table, page 16) will be seen southeastward of the Cranberry islands. The **stone beacon** on East Bunker Ledge is nearly midway between Little Cranberry Island and Mount Desert Island. **Suttons Island**, lying west of East Bunker Ledge beacon and in the middle of the channel, has a number of summer cottages on its north side. **Bear Island**, north of the western end of Suttons Island, is small and high with a white light-tower on its western end.

Channels.—The approach from eastward is somewhat obstructed by ledges and islands, but the most dangerous are marked by beacons and buoys; **Bear Island Lighthouse** is the aid for approaching from eastward No difficulty should be experienced in entering in the daytime or on a clear night. The least depth in the channel north of Suttons Island is about 7½ fathoms. The channel south of Suttons Island is not recommended for vessels of over 18 feet draft.

Approaching from southward the channel crosses Cranberry Island Bar, which has 14 feet at low water. Two ledges contract the channel south of the bar to a width of about 250 yards, where it is marked by buoys. **South Bunker Ledge** lies about in the middle of the approach and is marked by a spindle. There is frequently a swell on the bar; if so, vessels of over 10 feet draft must wait for a rising tide before crossing.

The best anchorage is south of the steamboat wharf on the north side of the harbor; light-draft vessels stand farther in; the water shoals gradually westward of the wharf, and there are several shoal, rocky spots near the head of the harbor.

Pilots.—In the daytime, with clear weather, a pilot is not required to enter from eastward. Strangers coming from westward and crossing Bass Harbor and Cranberry Island bars can take a pilot at Bass Harbor, if desired. Pilots for the waters eastward and westward can generally be found at Southwest Harbor by making inquiries on shore.

Supplies.—Anthracite coal and ship-chandler's stores in limited quantities can be had alongside the wharves. Water and provisions can be obtained.

Ice does not interfere with navigation except during the most severe winters, and then only for a short time.

The **tides** are the same as at Bar Harbor (see table, page 27).

SAILING DIRECTIONS, SOUTHWEST HARBOR.

1. ***Approaching from Eastward.***—*I. From the whistling buoy off Schoodic Island* steer **W. ⅛ S.** for 8 miles. When Baker Island Lighthouse bears about *S.* and Bear Island Lighthouse bears **NW.** by **W. ¼ W.**, steer for the latter on the bearing, and proceed as directed in paragraph I or II, section 2, following.

* Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **306, 307, 308, 292**, scale of each $\frac{1}{40,000}$, price of each $0.25.

Or, steer **W.** $\frac{5}{8}$ **N.** for $8\frac{5}{8}$ miles and pass about 650 yards north of East Bunker Ledge beacon. Leave black spar buoy No. 3 about 150 yards on the port hand, and steer **W.** $\frac{5}{8}$ **N.**; then follow the directions in paragraph III, section 2, following.

II. From the whistling buoy off Baker Island steer **N.** $\frac{1}{2}$ **E.**, leaving Baker Island $\frac{5}{8}$ mile on the port hand and passing well eastward of three black spar buoys northward of the island. When Bear Island Lighthouse bears **NW.** by **W.** $\frac{1}{4}$ **W.**, steer for it and proceed as directed in paragraphs I or II, section 2, following.

III. From Frenchman Bay.—Steer to bring Egg Rock Lighthouse to bear *NE.* $\frac{1}{4}$ *E.*, distant not less than 1 mile, and steer **SW.** $\frac{1}{4}$ **W.** until Bear Island Lighthouse bears **NW.** by **W.** $\frac{1}{4}$ **W.**; then proceed as directed in paragraphs I or II, section 2, following.

Or, to pass northward of East Bunker Ledge, when on the **SW.** $\frac{1}{4}$ **W.** course and Otter Cliff bell buoy bears *NW.*, distant about $\frac{1}{4}$ mile, steer **WSW.** $\frac{3}{4}$ **W.**; and when Lewis Rock buoy (spar, black, No. 3) is abeam, distant 150 yards, and in range with East Bunker Ledge beacon, proceed as directed in paragraph III, section 2, following.

Remarks.—On the **W.** $\frac{1}{8}$ **S.** course, East Bunker Ledge beacon and Suttons Island will be on the starboard bow, and **Sperlin Point**, the north point of Great Cranberry Island, will be ahead. There are no dangers until up to East Bunker Ledge.

Cod Ledge, with a least depth of 10 fathoms on it, lies about $3\frac{3}{4}$ miles **NE.** by **E.** from Baker Island Lighthouse.

Dangers.—**East Bunker Ledge** is a shoal, with bare, rocky ledges on it, about $\frac{1}{4}$ mile long in a **NNE.** and **SSW.** direction. It is marked by a white, square, stone beacon, on the southernmost of the ledges, which lies about 1 mile from the eastern end of Suttons Island and $2\frac{1}{2}$ miles **N.** $\frac{1}{8}$ **W.** from Baker Island Lighthouse. Coming from eastward it will be difficult to distinguish the beacon until within about 2 miles of it unless it faces the sun.

Harding Ledge, a rocky shoal making out about $\frac{1}{4}$ mile eastward from Little Cranberry Island, is marked on its eastern end by a buoy (spar, black, No. 3) which lies $1\frac{1}{4}$ miles **N.** from Baker Island Lighthouse.

Otter Cliff Ledge, a rocky shoal, bare at low water, about $\frac{1}{4}$ mile **SE.** from Otter Cliff, is marked by a black bell buoy, lying $\frac{1}{8}$ mile **SE.** from the ledge and $2\frac{5}{8}$ miles **NE.** by **E.** $\frac{5}{8}$ **E.** from East Bunker Ledge beacon.

Lewis Rock, $\frac{1}{4}$ mile **N.** from East Bunker Ledge beacon, is a small rocky spot with 6 feet of water over it, marked on its northern side by a buoy (spar, black, No. 3).

2. *Entering from Eastward.—I. Passing Southward of East Bunker Ledge and Northward of Suttons Island.*—With Baker Island Lighthouse bearing about *S.* and Bear Island Lighthouse **NW.** by **W.** $\frac{1}{4}$ **W.**, East Bunker Ledge beacon will bear about *NNW.* $\frac{3}{4}$ *W.*, distant about $\frac{5}{8}$ mile. From this position steer for Bear Island Lighthouse, leaving East Bunker Ledge beacon $\frac{1}{4}$ mile on the starboard hand and the northeast end of Suttons Island 400 yards on the port hand; when Long Pond Shoal buoy (spar, red, No. 6) bears *N.*, distant about 300 yards, steer about **W.** so as to pass 250 yards north of the west end of Suttons Island, and 100 to 200 yards southward of Southeast Point Greening Island buoy (spar, red, No. 6); then steer about **WNW.** $\frac{1}{2}$ **W.**, leaving Greening Ledge buoy (spar, red, No. 8) about 250 yards on the starboard hand. Anchor in mid-harbor with the steamboat wharf on the northern side of the harbor bearing about *N.*, in about 4 fathoms.

II. Passing southward of Suttons Island.—Bring East Bunker Ledge beacon to bear *NNW.* $\frac{3}{4}$ *W.*, distant $\frac{5}{8}$ mile, and steer **W.** $\frac{1}{2}$ **N.** so as to pass about 100 yards northward of Sperlin Rock buoy (spar, red, No. 2), and when abreast of it steer **NW.** by **W.** $\frac{3}{4}$ **W.** for the entrance of Southwest Harbor, and anchor as directed in paragraph I. Do not use this passage at night.

III. Passing Northward of East Bunker Ledge.—With East Bunker Ledge beacon bearing *S.*, distant a little over $\frac{1}{4}$ mile, steer **W.** $\frac{5}{8}$ **N.**, passing midway between Bear Island and Suttons Island, and when the west end of Suttons Island bears *S.* steer **W.** $\frac{1}{4}$ **S.** until Southeast Point Greening Island buoy (spar, red, No. 6) bears *N.*, distant 150 to 200 yards, then steer **WNW.** $\frac{1}{2}$ **W.** and anchor as directed in paragraph I.

Remarks.—At night the passage northward of Suttons Island is the one generally used. On the **NW.** by **W.** ¼ **W.** course do not allow Bear Island Light to fall anything westward of this bearing until ¼ mile beyond the point where Otter Cliff (Mount Desert Island) closes in Egg Rock Light; this will clear East Bunker Ledge.

On the **W.** ⅝ **N.** course, Seal Harbor buoy (nun, red, No. 2) will be left about 200 yards, and Bowden Ledge buoy (spar, red, No. 4) and Long Pond Shoal buoy (spar, red, No. 6) about 300 yards, on the starboard hand.

Suttons Island is comparatively bold-to, and may be approached as close as 250 yards. There is a passage with 15 feet of water between Greenings Island and Clarke Point, which is used by coasters and small steamers going into Somes Sound (see heading).

Dangers.—A sunken ledge with 4 feet over it makes southward about 300 yards from the east point at the entrance to Seal Harbor. It is marked on its southern end by a buoy (nun, red, No. 2) lying nearly ¼ mile **NNW.** from East Bunker Ledge beacon. It should be left about 150 yards on the starboard hand entering from Frenchman Bay.

Bowden Ledge, lying 1¼ miles **E.** by **S.** from Bear Island Lighthouse, is a rocky shoal with 2 feet of water on it, lying about 300 yards from Mount Desert Island. It is marked on its southern edge by a buoy (spar, red, No. 4), which should be left on the starboard hand when entering.

Long Pond Shoal is a rocky shoal with 5 feet of water on it, marked by a buoy (spar, red, No. 6) lying nearly ⅝ mile **ESE.** ¼ **E.** from Bear Island Lighthouse. Forming a part of the same shoal is a 14½-foot spot about 400 yards eastward of the buoy.

Old Tom is a small ledge with a depth of 28 feet over it, and lies ¼ mile **WSW.** ¼ **W.** from East Bunker Ledge beacon. This ledge is dangerous only for deep-draft vessels, and in a heavy sea or swell.

Sperlin Rock is a 7-foot rocky spot about midway between Suttons Island and Great Cranberry Island. It is marked about 50 feet from its northern side by a buoy (spar, red, No. 2) lying 1⅝ miles **WSW.** ¾ **W.** from East Bunker Ledge beacon.

Greenings Island, lying on the north side of the entrance to Southwest Harbor, has shoals making out 200 to 350 yards from it on all sides. It is marked off its southeast end by a buoy (spar, red, No. 6), and off its southwest end (**Greenings Ledge**) by a buoy (spar, red, No. 8), which is also a guide to the passage between Greenings Island and Clarke Point.

1 A. ***Approaching and Entering, from Westward.—I. Passing South of Long Island.***—Shape the course so as to pass about 1 mile south of Long Island Head, the southeastern end of Long Island, and when it bears *N.* steer **NE.** for 3¼ miles until Great Duck Island Lighthouse bears *E.* ½ *S.*, distant about 2 miles, then steer **N.** by **E.** ¼ **E.** for 5 miles to Long Ledge black bell buoy. Leave the buoy 200 yards on the port hand and steer about **NE.** ¼ **N.** for the Fairway buoy (can, white and black perpendicular stripes). Leave the Fairway buoy on either hand and haul a little eastward, passing midway between Cranberry Island Ledge buoy (spar, red, No. 2) and Flynn Ledge buoy (spar, black, No. 3). When about 200 yards beyond the black buoy change course to **N.** by **E.**, heading for a black and white perpendicularly striped can buoy. Leave this buoy on either hand and steer about **N.** ½ **W.**, and when off the entrance to Southwest Harbor haul westward and anchor as directed in section 2, foregoing.

II. Deep-draft vessels, to pass east of Baker Island.—When about 1 mile south of Long Island Head steer **NE.** so as to pass about ½ mile northwestward of Little Duck Island. When the northwestern end of Little Duck Island bears *SE.* steer **ENE.** for the whistling buoy off Baker Island, and when up to it follow the directions given in sections 1 and 2, foregoing.

III. Coming from Blue Hill Bay and across Bass Harbor Bar.—Steer so as to pass 350 yards southward of Bass Harbor Head Lighthouse, and when across Bass Harbor Bar steer **ESE.** ¾ **E.** for Long Ledge bell buoy; pass 150 yards southward of the buoy and steer **NE.** ¼ **N.** for the Fairway buoy, and follow the directions in paragraph I, preceding.

Remarks.—Long Island Head is bold-to but should not be approached closer than ¼ mile in stormy weather, as a very heavy sea breaks on it.

On the **N.** by **E.** ¼ **E.** course the Duck Islands will be left about 2 miles on the starboard hand and Great Gotts Island ⅞ mile on the port hand; The Drums and Horse Shoe Ledge will be left ⅞ mile on the port hand.

The **N.** by **E.** course across Cranberry Island Bar leads about midway between High Head and Sea Wall Point with the eastern end of Greenings Island a little on the port bow.

There is a best depth of 12 feet at low water on Bass Harbor Bar; frequently there is a heavy swell, when vessels of over 8 feet draft should not attempt it at low water.

Dangers.—**The Drums**, lying 2¼ miles **NE. ½ N.** from Long Island Head, is a ledge showing bare at low water, and marked off its southeastern end by a buoy (spar, black, No. 1).

Horse Shoe Ledge is a large unmarked rocky ledge, bare at low water, lying 1⅛ miles **N. ¾ E.** from The Drums buoy.

The Nubble is a dangerous reef, mostly bare at low water, and with a few detached rocks showing at high water; it makes out ⅛ mile in a southeasterly direction from Mount Desert Island, about 1⅛ miles **E.** from Bass Harbor Head Lighthouse. Off its end is Long Ledge bell buoy (black), which should be left on the port hand when standing in for Cranberry Island Passage.

South Bunker Ledge is a detached ledge about 400 yards in diameter, and lies 3¾ miles **W. ½ N.** from Baker Island Lighthouse and about 2⅝ miles **E.** by **S.** from Bass Harbor Head Lighthouse. It shows partly bare at half tide and is marked by a spindle (iron, red, cage on top) near the middle of the ledge.

Cranberry Island Ledge is a rocky shoal, with 4 to 9 feet of water on it, making out in a westerly direction from the southwest end of Great Cranberry Island. It is marked on its end by a buoy (spar, red, No. 2).

Flynn Ledge, with 2 to 11 feet of water on it, makes out ½ mile **SSE. ½ E.** from Sea Wall Point, and is marked on its end by a buoy (spar, black, No. 3).

Cow Ledge is a rocky shoal, with a spot bare at low water, making out about ¼ mile westward from Sperlin Point. It is marked off its western end by a buoy (spar, red, No. 4). The ledge making northward 250 yards from Sperlin Point is marked by a buoy (spar, red, No. 4½).

NORTHEAST HARBOR*

is an excellent anchorage for small vessels; its entrance is **NNW.** from Bear Island. The head of the harbor is shoal, but good anchorage in 19 feet of water, with soft bottom, will be found in mid-channel inside the entrance. There are several large summer hotels on the shores of the harbor, and on the western side, inside the entrance, is the steamboat wharf, at which there is 8 feet at low water. Fresh water can be obtained here.

SAILING DIRECTIONS, NORTHEAST HARBOR.

1. ***From Eastward.***—Follow the directions for approaching and entering Southwest Harbor (sections 1 and 2, pages 78, 79), and when Long Pond Shoal buoy (spar, red, No. 6) bears *N.*, distant about 300 yards, steer **W.** by **N.**, passing about 400 yards southward of Bear Island Lighthouse, and when the latter bears *NE.* steer **N.** by **W. ½ W.** Leave Northeast Harbor Ledge buoy (spar, red, No. 2) close-to on the starboard hand, and steer about **N.**; pass midway between the shores at the entrance, and anchor in mid-channel just above the wharf. See remarks and dangers, under section 1 A.

1 A. ***From Westward.***—Follow the directions for approaching Southwest Harbor, section 1 A, page 80; when across Cranberry Island Bar, and close to the white and black perpedicularly striped can buoy westward of Sperlin Point, steer **NNE. ½ E.**, and when up to Northeast Harbor Ledge buoy, leave it on the starboard hand and proceed as directed in section 1, preceding.

Remarks and dangers.—Approaching Northeast Harbor, see remarks and dangers under sections 1 and 2, Approaching and Entering Southwest Harbor from Eastward, and section 1 A from Westward.

Bear Island has shoals making southward 200 yards, and also northward, joining it to Mount Desert Island.

Northeast Harbor Ledge is a rocky shoal, bare at low water, lying fair in the entrance to Northeast Harbor. It is marked on its western side by red spar buoy No. 2, lying 600 yards **NW. ½ W.** from Bear Island Lighthouse, and on its eastern side by black spar buoy No. 1. There is deep water on all sides of the ledge, but the best passage into the harbor is westward of it.

SOMES SOUND.†

This is a narrow body of water, about 4½ miles long and ¼ to ¾ mile wide, making into the south shore of Mount Desert Island in a **N.** by **E.** direction. It lies between steep, rocky shores, and has a narrow entrance with

*Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **306, 292**, scale of each $\frac{1}{40,000}$, price of each $0.25.

†Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **306, 307, 292**, scale of each $\frac{1}{40,000}$, price of each $0.25.

few dangers. Somes Sound is not used as an anchorage by vessels seeking shelter, on account of its great depth and narrow entrance. Sailing vessels should enter under easy canvas on account of the heavy squalls of wind which occasionally strike down from the mountains. Greenings Island lies in the middle of the approach, with a channel on either side of it. The eastern channel is the wider, and has a least depth of 8½ fathoms; the western channel has a depth of 15 feet, and is very narrow. The channel in the entrance off Manchester Point is only 200 yards wide between the 18-foot curves; above the point it widens.

Somes Harbor, in the northwestern side, at the head of the sound, is a small cove, shallow on its western side and at its head. The village of **Somesville** is on the west shore of the harbor. The deepest draft entering the sound is 17 feet. There is 10 feet at low water alongside the wharves. During the summer a small steamer runs to Southwest Harbor from Somesville.

Prominent features.—Bear Island Lighthouse (see table, page 16) is the most prominent guide to the approach from eastward. **Manchester Point,** the eastern point at the entrance, is comparatively low and grassy, with several summer houses near its end. The western point at the entrance is high and thickly wooded, except near the water, where it slopes gradually and is bare of trees. The western shore, above Manchester Point and up to Robinsons Mountain, is high and bold-to; above this it is somewhat lower, and has a number of granite quarries.

Pilots.—Strangers bound into Somes Sound generally take a pilot at Southwest Harbor.

SAILING DIRECTIONS, SOMES SOUND.

1. ***Approaching and Entering, from Eastward, passing North of Suttons Island.***—Follow the directions for approaching and entering Southwest Harbor, pages 78 and 79, until Bear Island Lighthouse bears *N.*, distant about 500 yards; then steer about **NW.** by **W.** ¾ **W.** for the northern end of Greenings Island.

When Gilpatrick Ledge spindle bears *NE.* by *E.* ¼ *E.*, steer **N.** by **W.** ¾ **W.**, so as to leave Manchester Point about 150 yards on the starboard hand, and Middle Rock buoy (spar, black, No. 7) about 25 yards on the port hand. As soon as the southwestern end of the point is abeam, steer **N.** ¾ **E.** for the high-water mark of Robinsons Mountain, on the western shore about 1¾ miles above Manchester Point. When nearly up to Robinsons Mountain follow a mid-channel course up the sound.

Bound to Somesville, follow the western shore above Robinsons Mountain, giving it a berth of at least 200 yards, and when up to Myrtle Ledge buoy (spar, red, No. 8) leave it about 100 yards on the starboard hand and steer **N.** Leave Bar Ledge buoy (spar, black, No. 9) 30 yards on the port hand and continue the **N.** course past Masons Ledge buoy (spar, black, No. 11), which should be left on the port hand. Anchor just above this buoy in 3½ fathoms water, soft bottom.

See the remarks and dangers under section 1 B, following.

1 A. ***Approaching and Entering, from Westward, crossing Cranberry Island Bar.***—Follow the directions for approaching and entering Southwest Harbor, page 80, and when across Cranberry Island Bar and up to the black and white perpendicularly striped can buoy westward of Sperlin Point, steer **N.** ¾ **E.** so as to pass about 300 yards eastward of Greenings Island. When Bear Island Lighthouse bears *E.*, steer **NNW.** so as to leave Manchester Point about 150 yards on the starboard hand, and Middle Rock buoy (spar, black, No. 7) about 25 yards on the port hand, and then proceed as directed in section 1, preceding.

See the remarks and dangers under section 1 B, following.

1 B. ***Approaching and Entering, from Southwest Harbor, passing West of Greenings Island.***—Pass about 150 yards westward of Greening Ledge buoy (spar, red, No. 8) and steer about **NNE.**; leave Clarke Point buoy (spar, black, No. 5) close-to on the port hand and continue the **NNE.** course for the western side of Manchester Point. Pass 150 yards westward of the point, leaving Middle Rock buoy (spar, black, No. 7) about

25 yards on the port hand, and steer **N. ¾ E.** for the high-water mark of Robinsons Mountain; then follow the directions in section 1, preceding.

Remarks.—When passing northward of Greenings Island, care should be taken to keep clear of Gilpatrick Ledge, which lies ¼ mile westward of Northeast Harbor. The northern shore of Greenings Island should be given a berth of 300 yards. When standing for the entrance to the sound, Middle Rock is avoided by keeping well over toward Manchester Point. For a distance of 1¼ miles above the point the eastern shore of the sound should not be approached closer than 400 yards; above this the shore is comparatively bold until up to Sargents Point.

The channel to Somesville, westward of Bar Island, is very narrow, and should be entered by sailing vessels with a fair wind only.

Dangers.—**Gilpatrick Ledge**, barely covered at high water, extends 300 yards southward from the eastern side of the entrance to Gilpatrick Cove, and is marked by a red spindle, which should be given a berth of over 150 yards.

Greenings Island has shoals making out about 200 yards from its northern shore. The extreme northern point is marked by a buoy (spar, black, No. 5).

Middle Rock, with 9 feet of water on it, lies on the western side of the entrance to Somes Sound and ¼ mile **N. ¼ W.** from North Point Greening Island buoy. It is marked by a buoy (spar, black, No. 7) and can be avoided by favoring Manchester Point, giving the latter a berth of 100 to 200 yards.

Greenings Ledge, on the southwest side of Greenings Island, is marked by red spar buoy No. 8.

A **1-foot rock** on the western side of the channel near the bar between Greenings Island and Clarke Point is marked by a buoy (spar, black, No. 5), which should be left close-to on the port hand leaving Southwest Harbor.

BASS HARBOR.*

This harbor, on the southwestern side of Mount Desert Island, is much frequented by vessels bound through the inland passages. It affords good anchorage for a limited number of vessels, in 12 to 24 feet of water, in the channel of the inner harbor; the outer harbor is exposed to southerly winds and has a depth of 4 to 7½ fathoms. The ledge at the entrance and other prominent dangers in the outer harbor are buoyed. A small village and fish-canning establishment are situated on the western shore of the inner harbor.

Prominent objects.—**Bass Harbor Head Lighthouse** (see table, page 16), on the eastern point at the entrance, is the most prominent mark approaching the harbor.

Channels.—The approach from eastward is across Bass Harbor Bar, which has 12 feet of water over it for a distance of between 250 and 500 yards southward of the lighthouse. The approach from westward through Blue Hill Bay is clear of dangers. The approach from southward is between Swan, Placentia, Black, and the Gotts islands; the channels between these islands can easily be followed in the daytime with clear weather. Entering the harbor a good channel leads on both sides of Weaver Ledge up to Harbor Point at the entrance to the inner harbor; above this it is narrow and winding, gradually decreasing in depth toward the head.

Anchorages.—The anchorage in the outer harbor is a little over ¼ mile northward of Weaver Ledge, in 20 to 45 feet of water. A limited anchorage will be found about 200 yards inside of Harbor Point Ledge buoy (spar, black, No. 5).

Pilots are not necessary for entering the outer harbor; they can be obtained at Bass Harbor for the waters eastward and westward by making signal while outside, or anchoring in the outer harbor.

Ice seldom prevents vessels entering the outer harbor.

Tides.—The mean rise and fall of tides is 10 feet; see also table, page 27.

SAILING DIRECTIONS, BASS HARBOR.

Directions for approaching Bass Harbor from westward, having come through Casco Passage, are given in treating of that passage.

1. ***Approaching and Entering, from Eastward, crossing Bass Harbor Bar.***—From Baker Island whistling buoy steer **WNW. ⅞ W.** for 6¾ miles for Bass Harbor Bar, passing close southward of Long Ledge bell buoy, and from 250 to 300 yards southward

*Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **307, 308, 292**, scale of each $\frac{1}{40,000}$, price of each $0.25.

of Bass Harbor Head Lighthouse. When across the bar, and the lighthouse bears *NE.*, steer **N.** by **W.** ½ **W.**, favoring the eastern shore, and anchor about ¼ mile northward of Weaver Ledge.

Remarks.—As there is frequently a heavy swell on Bass Harbor Bar, vessels of 10 feet draft should not attempt to cross it at low water except with a smooth sea. Strangers should not attempt to proceed above Harbor Point into the inner harbor without a pilot.

Dangers.—**The Thumper** is an unmarked rocky ledge, showing bare at low water, lying 300 yards south of Baker Island. It and an unmarked shoal, bare at low water ⅜ mile **SW.** from Baker Island, will be left about ¼ to ⅜ mile on the starboard hand, on the **WNW.** ½ **W.** course.

South Bunker Ledge will be left at least ¼ mile on the starboard hand, and Long Ledge bell buoy southward of **The Nubble** will be passed close-to. For description of these dangers see "Dangers," page 81.

Weaver Ledge is a rocky spot, bare at low water, lying midway of the entrance to Bass Harbor. It is marked on its eastern side by a buoy (spar, black, No. 1), and on the western side by a buoy (spar, red, No. 2). The buoys may be passed close-to on their respective sides.

1 A. ***Approaching and Entering, from Southeastward, for deep draft.***—Pass ¼ mile or more southward of Great Duck Island Lighthouse, and then bring the lighthouse to bear *SE.* by *E.* ½ *E.* and steer **NW.** by **W.** ½ **W.**, heading for the western end of the Green Islands. As the western Green Island is approached leave it 400 yards on the starboard hand and steer **NNW.** ½ **W.** so as to pass about 400 yards westward of Placentia Island. When the western end of the latter bears *E.* steer **NE.** ½ **N.** Pass about midway between Lopaus Point and Weaver Ledge buoy (spar, red, No. 2), and anchor about ¼ mile northeastward of the buoy in 4 to 7 fathoms water, soft bottom.

Remarks.—On the **NW.** by **W.** ½ **W.** course Black Island will be on the starboard bow, and Drum Island and Green Islands, a group of small bare islands, will be a little on the starboard bow. The Drums and the buoy off its southern end will be left nearly ½ mile on the port hand. Placentia Island will be opened on the starboard bow northward of Black Island.

Drum Island, a bare rocky islet, lies nearly ¾ mile **SSE.** from the southeastern end of Black Island; it is comparatively bold-to and can be approached as close as 150 yards. The **Green Islands** are just westward of Drum Island and should be given a berth of 400 yards.

The **NNW.** ½ **W.** course leads westward of Black and Placentia islands.

On the **NE.** ½ **N.** course Lopaus Point will be a little on the port bow and Bass Harbor Head Lighthouse will be well on the starboard bow. The northern side of Placentia Island is bold-to and can be approached as close as 150 yards. The best anchorage is southward of Bass Harbor Ledge buoy (spar, black, No. 3).

Dangers.—**Horse Shoe Ledge** is about 500 yards long **N.** and **S.** and shows partly bare at low water; it lies ¾ mile **E.** by **S.** from Drum Island and about 3 miles **W.** from the northern end of Little Duck Island. The ledge is left ½ mile on the starboard hand when on the **NW.** by **W.** ½ **W.** course.

A spot with less than 6 fathoms over it lies ⅜ mile **SE.** from Drum Island.

The Drums are described on page 81.

Staples Ledge is described under section 1 B, following, and Weaver Ledge under section 1, preceding.

1 B. ***Approaching and Entering, from Southward.***—From a position about 1 mile westward of Southwest Point of Long Island, steer **N.** by **E.** ¾ **E.**, heading for Ram Island, passing about midway between Long Island and Johns Island, and the Sister Islands and Swan Island. When Ram Island is ⅜ mile distant ahead steer **NE.** by **E.** ½ **E.**, passing midway between it and the Sister Islands. When the easternmost of the Sister Islands bears *SSW.* steer **N.** ¾ **W.**, and when the western end of Placentia Island bears *E.*, distant 400 to 500 yards, steer **NE.** ½ **N.** Pass about midway between Lopaus Point and Weaver Ledge buoy (spar, red, No. 2) and anchor as directed in section 1 A, foregoing.

Remarks.—On the **N.** by **E.** ¾ **E.** course **East Point,** the eastern point of Swan Island, will be open a little westward of the Sister Islands. Johns Island Ledge buoy (nun, red, No. 2) should be left about ¾ mile on the port hand. **Johns Island,** showing a bare, rocky shore and covered with a scrubby growth of trees, should be left about ½ mile on the port hand. **Ram Island** is a rocky islet lying about ¼ mile from the shore of Swan Island and about ½ mile northwestward of the westernmost of the Sister Islands.

On the **NE.** by **E.** ½ **E.** course East Point should be given a berth of at least ¼ mile when eastward of it. Placentia Island is bold-to on its western side and can be approached as close as 150 yards.

Dangers.—**Johns Island Sunken Ledge,** with 6 feet of water on it, is marked by a buoy (nun, red, No. 2) which is about 100 feet southwest from the shoal part of the ledge and lies ¾ mile **SSW.** from Johns Island, and 1¾ miles **WNW.** ¾ **W.** from Southwest Point.

Beach Ledge, unmarked rocky spots with 14 and 16 feet of water on them, lies ¾ mile **NW.** by **N.** from Southwest Point, and about ½ mile from the shore of Long Island; it should be left about ¼ mile on the starboard hand when on the **N.** by **E.** ¾ **E.** course.

A **ledge** extends 300 yards in a **SW.** direction from the southern end of the western Sister Island.

An unmarked ledge with 16 feet of water on it lies ¼ mile **ENE.** from East Point, the eastern end of Swan Island, and should be left from ¼ to ⅜ mile on the port hand on the **N.** ¾ **W.** course.

Staples Ledge, bare at low water, is marked on its southeastern side by a buoy (spar, red and black horizontal stripes) lying 1 mile **NW.** by **W.** ¾ **W.** from the western end of Placentia Island. The buoy should be given a berth of 200 yards.

Weaver Ledge is described under section 1, foregoing.

BURNT COAT HARBOR.*

This is a small, well-sheltered anchorage on the southwestern side of Swan Island, much used by fishermen as a harbor of refuge, but seldom by other vessels. The anchorage eastward of the lighthouse is about 500 yards wide, with a depth of 3½ to 6 fathoms, soft bottom. There is also good anchorage in the channel north of the lighthouse for smaller vessels in 13 to 24 feet of water. The western point at the entrance is marked by **Burnt Coat Harbor Lighthouse** (see table, page 16). Southward and westward of Swan Island are numerous islands, rocks, and ledges, between which two good channels lead to the harbor entrance, which is about 150 yards wide. The approach from eastward is south of the islands and ledges lying between Long and Swan islands; from westward it is south of the islands and ledges lying southward and southeastward of Isle au Haut and Marshall Island. The harbor is entered from Jericho Bay through the passage between Marshall Island and Hat Island.

The village of **Swans Island** is on the shore of the harbor. Supplies for fishermen can be obtained here.

For **tides** see table, page 27.

SAILING DIRECTIONS, BURNT COAT HARBOR.

1. ***Approaching and Entering, from Eastward.***—Shape the course so as to pass about ½ mile south of Long Island Head and then steer **W.** by **N.** until Johns Island Ledge buoy (nun, red, No. 2) bears *NE.*, distant about ½ mile, then steer **NW.** ¾ **N.** so as to pass about midway between Green and Brimstone islands; and when Burnt Coat Harbor Lighthouse bears **NE.** ½ **E.** steer for it, and leave the Fairway bell buoy close-to on either hand.

When about 400 yards from the lighthouse steer about **E.** by **N.** and pass about 150 yards south of it, and midway between it and Harbor Island Ledge spindle (red, with wheel on top). Anchor eastward or northeastward of the lighthouse but not more than ¼ mile from it.

At night continue the **W.** by **N.** course from Long Island Head about 3¾ miles, and then steer **NW.** until Burnt Coat Harbor Light shows clear of the western end of Harbor Island and bears **NE.** by **N.**, then steer for the light until Brimstone Island is abaft the port beam; then bring the light to bear **NE.** ½ **E.** and steer for it, and proceed as directed in the preceding paragraph.

Remarks.—**Long Island Head,** the southeastern point of Long Island, shows prominently and is bold-to. On the **W.** by **N.** course Johns Island Dry Ledge will be well on the starboard bow, and is left ½ mile on the starboard hand.

When on the **NW.** ¾ **N.** course, Green Island will be on the starboard and Brimstone Island on the port bow. **Hat Island** will be a little on the starboard bow; it lies about ¼ mile off the southwestern end of Swan Island, is about 100 feet high, and covered with trees, except on its top, which shows bare in places. The western shore of Harbor Island should be given a berth of 125 yards or more.

* Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **308**, scale $\frac{1}{40,000}$, price $0.25.

Dangers.—**Johns Island Dry Ledge** lies 2 miles **WNW.** from Southwest Point of Long Island and ¼ mile **SW. ¾ W.** from Johns Island. It shows prominently at low water.

Johns Island Sunken Ledge, with 6 feet of water over it, lies ⅝ mile **SE.** from Johns Island Dry Ledge, and is marked on its southwest side by Johns Island Ledge buoy (nun, red, No. 2).

Sally Prudes Ledge, a small spot with 9 feet over it, lies about ¼ mile **NW.** from Johns Island Dry Ledge.

Gooseberry Island Ledge (The Bull), on the northwestern side of the entrance, is partly bare at low water, and its southern end is marked by a buoy (spar, black, No. 3) which lies nearly ¼ mile **WSW.** from the lighthouse.

Gooseberry Island lies about ⅝ mile **W.** from the lighthouse, and ¼ mile westward of that island is **High Sheriff,** a small bare rock. Between these two islands there is a ledge partly bare at low water called **Sheriff Ledge.** These are all left on the port hand in approaching the harbor.

Seal Ledge, having 12 feet of water over it, lies ¼ mile **E.** from Black Ledge, the low barren islet 1¼ miles **SW.** by **W.** from Heron Island; it is marked by a buoy (spar, black, No. 1) lying ¼ mile eastward of the ledge.

1 A. ***Approaching and Entering, from Westward.***—Pass close to the whistling buoy about ¾ mile south of the spindle on Roaring Bull Ledge, south of Isle au Haut, and when the spindle bears *N.*, steer **E. ⅞ N.** about 3¼ miles; then steer **NE.** by **E.** until Burnt Coat Harbor Lighthouse bears **NE.** by **N.**; steer for the lighthouse on this bearing until Brimstone Island is passed, then haul northward until the lighthouse bears **NE. ½ E.** and steer for it again. When the lighthouse is about 400 yards distant, steer about **E.** by **N.** and anchor as directed in section 1, preceding.

Remarks.—The **E. ⅞ N.** course leads about ¾ mile south of Eastern Ear and Cold ledges. On the **NE.** by **E.** course Black Ledge and Heron Island will be on the port bow. When Black Ledge is abeam, distant about ¾ mile, Seal Ledge buoy (spar, black, No. 1) should be made on the port bow. On the **NE.** by **N.** course this buoy is left about 500 yards on the port hand and Heron and Brimstone islands are left over ¼ mile on the port hand. On the **NE. ½ E.** course for the lighthouse the Fairway bell buoy (black and white perpendicular stripes) should be left close-to on either hand.

Dangers.—**Eastern Ear Ledge** and **Cold Ledge** are described on page 88.
Seal Ledge and other dangers near the sailing lines are described under section 1, preceding.

1 B. ***Approaching and Entering, from Jericho Bay.***—Having come through Eggemoggin Reach, Deer Island Thorofare, or Merchants Row (see sailing directions under those headings), when midway between Halibut Rocks and Hat Island steer **SE. ¾ E.** until close to the Fairway bell buoy, and Burnt Coat Harbor Lighthouse bears **NE. ½ E.**; then steer for the lighthouse until it is about 400 yards distant and steer **E.** by **N.** Anchor as directed in section 1, preceding.

Remarks.—On the **SE. ¾ E.** course High Sheriff and Gooseberry islands will be on the port bow and should be left about ¼ mile on the port hand; Fairway bell buoy (black and white perpendicular stripes) should be made ahead. The Bull buoy (spar, black, No. 3), marking Gooseberry Island Ledge, will be seen southeastward of Gooseberry Island; it is left on the port hand when entering the harbor.

Dangers.—**Hat Island Ledge** makes out ¼ mile westward from Hat Island and is marked near its end by a buoy (spar, red, No. 2) which is left on the port hand when coming from westward. About ¼ mile **SW.** from the middle of Hat Island are two small 14-foot spots.

A shoal with 10 to 14 feet of water over it makes out ⅜ mile northward from the northern end of Marshall Island. This can be avoided by keeping Halibut Rocks beacon bearing westward of **WNW. ½ W.** until the western end of Hat Island bears northward of **NNE.**

The dangers immediately westward of Burnt Coat Harbor entrance are described under section 1, preceding.

BLUE HILL BAY*

lies west of Mount Desert Island; it is about 14 miles long in a **N.** and **S.** direction, and contains several large and some small islands, between which are good channels with deep water. The dangers are comparatively few, and the most prominent are marked by buoys. There are numerous coves on both sides of the bay, and

*Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **307**, scale $\frac{1}{40,000}$, price $0.25. The entrance is shown on chart **308**, scale $\frac{1}{40,000}$, price $0.25.

its head is divided into several large arms, the most important of which is **Union River Bay,** the approach to the city of Ellsworth and the town of Surry.

Blue Hill Bay is approached from eastward across Bass Harbor Bar, from southward between Black Island and Swan Island, and from westward through Jericho Bay, which is entered through Merchants Row, Deer Island Thorofare, or Eggemoggin Reach. These approaches are more or less obstructed by islands and ledges, but are sufficiently marked to be safely navigated in clear weather. Blue Hill Bay is the eastern approach to Casco Passage and York Narrows (see heading).

Bass Harbor, marked by a lighthouse. is at the southeastern point at the entrance to the bay (see page 16).

Mitchells Cove, Duck Cove, Goose Cove, and **Lattys Cove** are small unimportant coves on the southwest side of Mount Desert Island, between Bass Harbor and Seal Cove; they are not sufficiently well sheltered to be used as anchorages.

Seal Cove, about 4 miles northward of Lopaus Point on the east shore of the bay, is a small but good anchorage much f.equented by fishermen.

Herricks Bay is a large, shallow, and unimportant bight on the western side of Blue Hill Bay and northwest from Green Island, which is marked by Blue Hill Bay Lighthouse (see table, page 16). The upper end of this bay is dry at low water.

Allens Cove, rarely used as an anchorage, is just westward of Herrimans Point on the western shore of Blue Hill Bay and 3½ miles **N.** of Green Island.

Pretty Marsh Harbor makes into the eastern shore of the bay **NE.** from Hardwood Island. It is a good harbor for small vessels; the post village of Pretty Marsh is at its head.

Bartletts Narrows lead between Mount Desert Island and Bartletts Island; the channel is narrow, but has a depth of 9 fathoms. The eastern shore is bold to.

WESTERN BAY

is northeastward from Bartletts Island and is a part of the waters which separate Mount Desert Island from the mainland. **Mount Desert Narrows** (see page 73) are at the head of Western Bay. **Goose Cove** is a large, shallow bight on the north side of the bay, at the head of which is the village of **West Trenton.** The deepest draft taken to an anchorage off the village is 11 feet. Strangers should anchor between Alleys Island and Oak Point in 7 fathoms. If wishing to go farther up take a pilot.

BLUE HILL HARBOR

is in the northwestern part of the bay, northwest from Long Island; it consists of a large bight, called the outer harbor, and a small arm extending northwestward to the village of **Blue Hill,** called the inner harbor. The latter has a narrow and crooked channel. Off the western shore of the outer harbor, and in the entrance to the inner harbor, are several ledges which extend ¼ mile from the shore in places; strangers should not attempt to enter the inner harbor without a pilot. Anchorage, sheltered from northerly and westerly winds, will be found in the outer harbor in 4 to 8½ fathoms of water. Vessels of 13 feet draft can enter the inner harbor at low water although the entrance is quite narrow, but when inside there is a good though small anchorage in 12 to 25 feet of water, sheltered from all winds. Vessels of 9 feet draft go to the village of Blue Hill at high water. The wharves are dry at low water. A steamer makes a landing at a wharf, near the entrance to the inner harbor. Strangers should take a pilot; if one has not been taken lower down the bay anchor ¼ mile south of the buoy (spar, black, No. 1), on eastern end of the middle ground, and wait for one. Ice closes the upper end of the harbor from December to April.

MORGANS BAY,

making northward between Blue Hill Harbor and Newbury Neck, is about 3 miles long in a **NNE.** and **SSW.** direction, but is little used. The entrance is obstructed by islands and ledges, leaving a very narrow channel with deep water close to the western shore. Good anchorage is found inside the islands in 6 fathoms, the water shoaling gradually toward the head of the bay.

UNION RIVER BAY

is a large bay extending about 5½ miles in a **N.** by **E.** direction between Oak Point on the east and Newbury Neck on the west. It is free from dangers, except near its northern end. The head of the bay is separated into two arms, **Union River,** the eastern, leading to the city of Ellsworth, and **Pattens Bay,** the western, leading to the town of Surry.

Pattens Bay is a long, narrow arm making northwestward from Union River Bay. The town of **Surry** is at its head. The deepest draft entering is 10 feet, but the depth in the channel up to the town is only 2 feet at low water, and the wharves run dry. Good anchorage will be found in the channel about ¼ to 1 mile below the town in 12 to 18 feet, soft bottom; deeper water, with good holding ground, will be found nearer the entrance. The steamboat wharf is on the north shore at the entrance to the bay. Ice closes the upper end of the bay during January, February, and March.

UNION RIVER,

emptying into the northeastern part of Union River Bay, is about ¼ mile wide for 1 mile; then it becomes narrow and has a crooked channel up to the city of Ellsworth, about 4 miles above its mouth. There are several rocks and ledges off the entrance; the most prominent are buoyed. The entrance above Weymouth Point is full of sawdust shoals, the depth over which is decreasing.

The city of **Ellsworth** is at the head of navigation. The deepest draft entering is 12 feet on very high tides: the usual draft is 10 feet. The least water in the channel is 2 feet, and at the wharves 5 feet, at low water.. Ellsworth is on the line of the Maine Central Railroad and has steamboat communication. Vessels bound to Ellsworth generally anchor off Weymouth Point and take a towboat or pilot; either will respond to signal.

Supplies.—Anthracite coal in limited quantity can be had alongside the wharf; provisions and some ship-chandler's stores can be obtained. Fresh water can be taken from the river at low water.

Repairs.—Light repairs to vessels can be made; there is a small marine railway; for extensive repairs the nearest place is Bangor or Rockland.

Marine Hospital.—Relief is furnished as for stations of Class IV of the U. S. Public Health and Marine-Hospital Service. Patients requiring hospital treatment are sent to the Marine Hospital at Portland, Me.

Freshets occasionally occur in the spring.

Ice closes the river from December to April.

For **tides** see table, page 27.

SAILING DIRECTIONS, BLUE HILL BAY.

1. ***Approaching and Entering, from Eastward.***—Follow the directions for approaching Bass Harbor, page 83, and after crossing Bass Harbor Bar steer about **NW.** by **W.** ½ **W.** until about 1½ miles westward of Lopaus Point, and the beacon on Ship and Barges Ledge bears *W.* by *N.*, distant about 1¼ miles, then be guided by the directions in section 2 or 2 A, following.

Remarks.—**Lopaus Point**, also called **Bass Harbor Point**, is a partly wooded, rocky head at the western side of the entrance to Bass Harbor.

1 A. ***Approaching and Entering, from Southward, passing East of Long Island.***—Bring Long Island Head to bear *W.*, distant ¾ mile, and steer **N.** ¾ **W.** for the westernmost of the Green Islands. When about ½ mile from it, change course to **NNW.** ½ **W.**, leaving it nearly ¼ mile on the starboard hand, and passing about 400 yards *W.* of Placentia Island. When the western end of Placentia Island bears *E.*, distant 400 yards, steer **N.**, passing about 1½ miles westward of Lopaus Point. When the beacon on Ship and Barges Ledge bears *W.* by *N.*, distant about 1¼ miles, follow the directions in section 2 or 2 A.

See also the directions in section 1 A, "Sailing Directions, Bass Harbor," page 84.

Remarks.—The **Green Islands** are two small, rocky islets lying about ¾ mile **S.** of Black Island and 1¾ miles **NE.** by **N.**, from Northeast Point of Long Island.

On the **NNW.** ½ **W.** course Black Island will be left a little over ¼ mile on the starboard hand. The western shore of Placentia Island is bold-to, and can be approached as close as 150 yards. On the **N.** course Bass Harbor will be open broad off the starboard bow, and the eastern entrance to Casco Passage and York Narrows will be seen westward. The beacon on Ship and Barges Ledge will show prominently off the port bow.

Dangers.—**The Drums** is a dangerous ledge, which shows bare at low water and is usually marked by a break; it lies 2¼ miles **NE.** ½ **N.** from Long Island Head, and is marked off its southeastern end by a buoy

(spar, black, No. 1). This ledge is avoided by keeping the western end of Placentia Island showing in range or westward of the westernmost of the Green Islands.

Northeast Ledge is a small spot, with 16 feet over it, lying ¼ mile **ENE.** from the northeast point of Long Island.

Beaumond Ledge, with 9 feet over it, and **Otter Island Ledge**, showing bare at low water, are two small ledges lying about 1 mile **WSW.** from the westernmost of the Green Islands. They are left well on the port hand.

Staples Ledge is a small ledge, dry at low water, lying 1 mile **NW.** by **W.** ¾ **W.** from the western end of Placentia Island; it is marked by a buoy (spar, red and black horizontal stripes) placed off its southeastern side.

1 B. ***Approaching and Entering, from Southward, passing West of Long Island.***—Follow the directions for approaching Bass Harbor from southward, page 84; when the west end of Placentia Island bears *E.*, distant 400 yards, steer **N.** and pass about 1½ miles westward of Lopaus Point; then be guided by the directions in section 2 or 2 A, following.

1 C. ***Approaching and Entering, from Westward, having come through Casco Passage.***—Having followed directions in section 1 A, "Sailing Directions across Blue Hill Bay through Casco Passage and across Jericho Bay" (page 97), when on the **E.** course and the tripod on Orono Point is ½ mile distant on the starboard quarter, steer **NE.** ¾ **E.**, leaving a red nun buoy, ¼ mile eastward of Black Island, about 150 yards on the port hand, and passing about ⅝ mile south of the beacon on Ship and Barges Ledge. When Ship and Barges beacon bears *WNW.*, distant about ½ mile, steer **N.** about 2 miles until the south end of Bar Island bears *W.* ¾ *N.* Then steer **NNW.** and follow the directions in section 2 or 2 A, according to destination.

Remarks.—On the **NE.** ¾ **E.** course there are no dangers except the Ship and Barges Ledge (see page 90). **Nutters Point**, about 90 feet high and thickly wooded, will be a little on the port bow; it is the northern point at the entrance to Goose Cove.

On the **N.** course the middle and highest part of Hardwood Island should be a little on the starboard bow; Ship and Trumpet islands will be left about ¼ mile on the port hand. **Bar Island** is the next island north of Trumpet Island.

1 D. ***Approaching and Entering, from Westward, having come through Eggemoggin Reach.***—Bring Devils Head to bear *N.*, distant about 500 yards, and steer **E.** by **S.**, heading for the north end of Mahoneys Island. Pass about 100 yards south of red nun buoy No. 4, and leave the red and black horizontally striped spar buoy on Hay Island Ledge about 200 yards on the starboard hand. When the southeastern end of Smutty Nose Island just opens westward of Blue Hill Bay Lighthouse, steer **ENE.** ¼ **E.** so as to pass midway between Smutty Nose and Mahoneys islands; red spar buoy No. 2 should be ahead and left on the port hand, and black can buoy No. 1 should be made on the starboard bow, and be left about 250 yards on the starboard hand. When Blue Hill Bay Lighthouse bears *NW.* steer **NNE.** ¾ **E.** for the southern end of Tinkers Island, and when the lighthouse bears *W.* ½ *N.*, steer **NNW.** ½ **W.** until the northern end of Tinkers Island bears *E.*; then—

Bound to Ellsworth, Surry, or Western Bay, steer **NE.** ¼ **E.**, heading for the southeastern end of Long Island, and leaving red spar buoys Nos. 2 and 4, marking Cow and Calf Ledge, about 400 yards on the starboard hand. Give the southern and southeastern shores of Long Island a berth of about ⅝ mile. Round the southeastern point of Long Island at a distance of ⅝ mile, steer **NNE.** for High Head, and follow the directions in section 2.

Bound to Blue Hill Harbor, steer **N.** ¾ **E.** nearly 2 miles, until the south end of Long Island bears abeam; then steer **NW.** ¼ **N.** and follow the directions in section 2 A.

Remarks and dangers.—On the **E.** by **S.** course the north end of **Mahoneys Island**, grassy top, with a few straggling trees, will be ahead. **Smutty Nose Island** is the small bare island **NW.** from Mahoneys Island. When nearly up with Smutty Nose Island, Mahoneys Island Ledge buoy (spar, red, No. 2) will be left about 350 yards on the starboard hand.

On the **ENE. ¼ E.** course, Blue Hill Bay Lighthouse will be broad off the port bow, and the entrance to Herricks Bay will be opened westward of it. The sailing line passes about midway between **Lamp Island**, a bare islet north of Pond Island and joined to the latter at low water by a bare ledge, and **Channel Rock**, a small, dark, bare rock ¼ mile **SE.** from Blue Hill Bay Lighthouse; red spar buoy No. 2 and black can buoy No. 1 mark the channel between Lamp Island and Channel Rock. When this rock is in range with the lighthouse the course should be changed to **NNE. ¼ E.**, care being taken to give the rock a berth of over ⅝ mile while eastward of it.

The **NNW. ½ W.** course does not approach the western shore of Tinkers Island closer than ¼ mile.

On the **NE. ¼ E.** course, the northern end of Tinkers Island should be given a berth of at least ½ mile to avoid Cow and Calf Ledge, and the southern shore of Long Island a berth of at least ¼ mile. A shoal with a depth of 10 feet near its end extends nearly ¼ mile eastward from the southeastern point of Long Island; it is marked at its end by a buoy (spar, black, No. 3).

On the **N. ¼ E.** course the western shore should be given a berth of about ⅝ mile. Herrimans Ledge, with 14 feet over it, lies ⅝ mile **E.** from Herrimans Point.

For the principal dangers passed while following these directions, see "Sailing Directions, Blue Hill Bay to Jericho Bay and Eggemoggin Reach by the passage north of Pond Island," pages 91-92.

2. ***From abreast Lopaus Point to Ellsworth or Surry.***—With the beacon on Ship and Barges bearing *W.* by *N.*, distant about 1¼ miles, steer **NNW.** nearly 5 miles. The passage eastward of Long Island will then be well opened, and the southern end of Hardwood Island will bear *E.* ½ *N.*; then change the course to **NNE.** for 3¾ miles, with High Head directly ahead. Then haul eastward, course **NE.**, so as to pass midway between it and the northern point of Bartletts Island. When the latter point bears *E.* by *S.*, steer **N.** by **E. ¼ E.**, directly up Union River Bay. Tupper Ledge buoy (spar, black, No. 7) will be made directly ahead; then—

Bound to Ellsworth, leave this buoy 200 yards on the port hand and steer **NNE. ½ E.**; anchor just southward of Weymouth Point (the western point at entrance to Union River) in 3¼ to 4 fathoms, and get a pilot.

Bound to Surry, leave the two black spar buoys marking Tupper Ledge nearly ¼ mile on the starboard hand, and steer about **NNW. ½ W.**, so as to leave red spar buoy No. 2 about 150 yards on the starboard hand. When Pattens Bay is entered, keep about midway between the shores; the channel narrows rapidly and strangers should anchor near the entrance.

Bound into Western Bay, follow the preceding directions until the northern point of Bartletts Island bears *E.* by *S.*, distant 1 mile, and then steer **ENE. ¼ E.** Anchor in 7 fathoms of water between the south end of Alleys Island and Oak Point.

Remarks.—On the **NNW.** course Ship and Barges Ledge, marked near its northern end by a black iron spindle, and at its southern end by a beacon, East Barge, Ship Island, Trumpet Island, Bar Island, and the buoy northeastward of it, and Tinkers Island will be left on the port hand in the order named. These islands are connected by shoals and should not in general be approached closer than ⅝ mile. Moose Island and Hardwood Island will be seen on the starboard bow, and Long Island, the large island lying in the northern central part of the bay, will be ahead.

On the **NNE.** course the southeastern point of Long Island should be given a berth of nearly ½ mile, and the black spar buoy off the point should receive a berth of ¼ mile; **High Head** the southeastern point of Newbury Neck, will be ahead. The western shore of Bartletts Island will be given a berth of ½ mile.

On the **N.** by **E. ¼ E.** course Weymouth Point, the western point at entrance to Union River, will be directly ahead.

Dangers.—**Ship and Barges Ledge**, lying ½ mile in a southeasterly direction from Ship Island, is about 350 yards in extent and partly bare at low water; it is marked at its northern end by a black iron spindle, and at its southern end by a black tripod beacon.

A shoal makes out about ⅝ mile in a southwesterly direction from the southwest point of Hardwood Island, and is marked at its end by a buoy (spar, red, No. 6).

A shoal makes eastward from the southeast point of Long Island for nearly ¼ mile, and is marked at its end by a buoy (spar, black, No. 3). The shores above this and up to Tupper Ledge are bold-to, and all danger may be avoided by giving them a berth of ¼ mile.

Tupper Ledge, a rocky shoal lying about ⅝ mile **SSW.** from Weymouth Point, has a spot bare at low water, and is marked by a buoy (spar, black, No. 7) off its southern end, and on its northwest side by a buoy (spar, black, No. 9).

Lords Rock, a small, rocky shoal with 9 feet of water on it, lies ⅝ mile **SE.** by **E.** ¼ **E.** from Tupper Ledge, and is marked on its western side by a buoy (spar, red, No. 10).

2 A. ***From Lopaus Point to Blue Hill.***—From a position about 1¼ miles *E.* by *S.* from Ship and Barges beacon steer **NNW.** about 5 miles; the southern end of Hardwood Island will then bear *E.* ½ *N.*, distant 1 mile. Then steer **NW.** ¼ **N.** about 3½ miles. The passage westward of Long Island will then be well opened and the course for 3¾ miles is **NNE.**, leaving Sand Point at least ¼ mile on the port hand. When the northern end of Long Island bears *E.* by *S.*, distant about 1 mile, steer **NNW.** ½ **W.** Eastern Point Middle Ground buoy (spar, black, No. 1) will be made on the starboard bow. Anchor about ¼ mile south of the buoy in 7 fathoms of water, and if bound farther up take a pilot.

Vessels bound to Blue Hill may also pass eastward and northward of Long Island, giving its shores a berth of ¼ mile or more.

Remarks.—On the **NNW.** course, see remarks under section 2.

On the **NW.** ¼ **N.** course, as Tinkers Island is passed, **Herrimans Point**, low, fringed with trees, will be seen on the port bow and the southwestern part of Long Island will be on the starboard bow; the passage westward of Long Island will not be opened until well northward of Herrimans Point. After the north end of Tinkers Island is passed, there are no dangers on the starboard hand over ¼ mile from the shore.

SAILING DIRECTIONS, BLUE HILL BAY TO JERICHO BAY AND EGGEMOGGIN REACH, BY THE PASSAGE NORTH OF POND ISLAND.

Vessels bound through Casco Passage and headed off by the wind, and those of over 12 feet draft, generally use this passage, which has a least depth of 19 feet in the channel north of Pond Island.

1. ***From Bass Harbor Bar bound West.***—From Bass Harbor Bar steer **WNW.** ¼ **W.** and pass about ¼ mile south of Ship and Barges Ledge beacon. When the beacon bears *NNE.* steer about **NW.** ¼ **N.** for Blue Hill Bay Lighthouse; leave West Barge about 300 yards on the starboard hand and Pond Island Point buoy (can, black, No. 1) about 250 yards on the port hand; round the buoy at this distance and steer **WSW.** ¼ **W.**, heading fair between Smutty Nose and Mahoneys islands, and so as to leave red spar buoy No. 2 about 150 yards on the starboard hand. Then—

I. Bound to Eggemoggin Reach, continue the **WSW.** ¼ **W.** course and pass about 350 yards north of Mahoneys Island and 250 yards south of Smutty Nose Island, and when the eastern end of the latter bears *NNE.*, distant 350 yards, steer about **W.** by **N.**; pass about 100 yards south of Devils Head Ledge buoy, leaving Hay Island Ledge buoy 200 yards on the port hand. When 500 yards westward of Devils Head Ledge buoy, follow the directions in section 1, "Sailing Directions, Eggemoggin Reach."

II. Bound to Deer Island Thorofare, when on the **WSW.** ¼ **W.** course, Blue Hill Bay Lighthouse bears *N.* by *E.*, steer **SW.** ¾ **S.**, and leave Mahoneys Island at least ¼ mile on the starboard hand. When Egg Rock beacon bears *E.*, steer **W.**, with Long Ledge beacon on the starboard bow, until up to Long Ledge buoy (spar, red, No. 2), when the directions in section 1, "Sailing Directions, Deer Island Thorofare," should be followed.

Remarks and dangers.—Standing across Blue Hill Bay on the **WNW.** ¼ **W.** course, the highest part of Pond Island near the southern end will be ahead. **Ship Island**, a small, grassy island with abrupt slope on south side, will be on the starboard bow. **East Barge** is a small, rocky islet just south of Ship Island, with shoal water between.

Ship and Barges Ledge is about 350 yards long in a **NW.** and **SE.** direction, and is bare at half tide; it lies nearly ⅝ mile **SSE.** from Ship Island and 2⅞ miles **WNW.** ⅝ **W.** from Lopaus Point. The northern end of the ledge is marked by a spindle (iron, 30 feet high) and its southern end by a tripod beacon (wood, black).

On the **NW. ¼ N.** course for Blue Hill Bay Lighthouse, **Channel Rock**, a small, bare rock, will be a very little on the starboard bow, almost in range with the lighthouse. **West Barge** is a small rocky islet, a little over ¼ mile westward of Ship Island; it is bold-to on its western side. **Lamp Island**, a small, bare islet, is near the northern end of the bare ledge making off north from Pond Island. In rounding black can buoy No. 1, red spar buoy No. 2, marking the 12-foot spot which lies 700 yards **S.** by **E.** ½ **E.** from Channel Rock, should be brought on the starboard bow.

Pond Island Point makes off shoal ½ mile northward from the island, and for over half this distance shows bare at half tide. Lamp Island is about ¼ mile **N.** of Pond Island. Off the northern end of the shoal is a buoy (can, black, No. 1).

Channel Rock is a small, bare rock ½ mile **SE.** from Blue Hill Bay Lighthouse. Shoals with a least depth of 3 feet over them extend nearly ⅝ mile **ESE.** ½ **E.** from this rock and about 250 yards southwestward from it.

A 12-foot spot lies about 700 yards **S.** by **E.** ½ **E.** from Channel Rock. This spot is marked by a buoy (spar, red, No. 2); the sailing line passes between this buoy and the buoy marking the shoals making off from Pond Island.

On the **WSW.** ¼ **W.** course, Mahoneys Island, having a few scattered trees, will be on the port bow, and Smutty Nose Island, small, rocky island **NW.** from Mahoneys Island, will be on the starboard bow. Passing between Mahoneys and Smutty Nose islands, Mahoneys Island Ledge buoy should be made on the port bow and left 350 yards on the port hand; Hay Island Ledge buoy can be left on either hand; the **W.** by **N.** course leads 250 yards northward of it, and south of Devils Head Ledge buoy.

Flye Island Ledge consists of a number of spots, with from 7 to 18 feet over them, that lie southward of Blue Hill Bay Lighthouse; these can be avoided, when coming from eastward, by keeping eastward of a line drawn from Channel Rock to the highest point of Mahoneys Island until Lamp Island is in range with West Barge.

Mahoneys Island has shoals and ledges making out about 250 yards northward and southward from it.

Shoals make out 125 yards southeastward and nearly 200 yards northwestward from Smutty Nose Island.

Mahoneys Island Ledge shows bare in some places at low water and lies **W.** by **S.** from Mahoneys Island; it is marked off its northwestern end by a buoy (spar, red, No. 2).

Hay Island Ledge, about 1 mile **W.** ½ **N.** from the northern end of Mahoneys Island, is described under heading "Eggemoggin Reach."

EGGEMOGGIN REACH.*

This passage between the Deer Isles and the mainland is about 11 miles long in a **NW.** and **SE.** direction, and has a least width of ⅝ mile at Byard Point. Its depth is sufficient for deep-draft vessels, and as the principal dangers are indicated by buoys, they can easily be avoided. The eastern entrance is well marked by **Devils Head**, a very prominent, high, rocky bluff on the southern end of Hog Island, and the western entrance by **Pumpkin Island Lighthouse** (see table, page 18) and Cape Rosier.

Greenlaws Cove, on the western side of the eastern entrance to Eggemoggin Reach, is long and narrow, and only navigable for small vessels. The post village of **Mountainville** is on the south shore of the cove.

Center Harbor, a small cove on the eastern side of the reach eastward of Torry Islands, has several wharves on its northern shore. The town of **Brooklin** is at the head of the harbor.

Benjamin River, the approach to the town of Sedgwick, makes into the eastern shore about two miles northward of Center Harbor. The channel at the entrance, northward of Cape Carter, has a least depth of 19 feet, but is much obstructed by ledges on both sides, leaving a passage only 100 yards wide at its narrowest part. The town of **Sedgwick**, at the head of navigation, can only be reached at high water, as the river runs dry some distance below. Steamers passing through the reach in summer make landings at the steamboat wharf, about 1 mile below the town.

North Deer Isle is a post village on the northern end of Deer Isle; it has a steamboat landing at which steamers of several lines touch on their way through the reach.

Billings Cove, on the northern shore of the reach, lies east of Byard Point. It affords good anchorage in 20 feet of water just inside of the point off the steamboat wharf, and is frequently used by vessels anchoring for the night. **Sargentville**, a post village on the eastern shore of the cove, is one of the landings for steamers passing through the reach in summer. Fresh water can be obtained alongside the steamboat wharf.

Eggemoggin is a post village and summer resort at the north end of Little Deer Isle.

Bucks Harbor is a small harbor on the north side of the reach, lying **NNE.** from Pumpkin Island Lighthouse; it affords excellent anchorage and is often used by small vessels. **Harbor Island**, lying in the middle of the harbor, has a good channel around it, which forms the anchorage. The post village of **South Brooksville** is at the head of the harbor.

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*Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **309**, scale, $\frac{1}{40,000}$, price $0.25.

Orcutts Harbor lies just westward of Bucks Harbor; its entrance is **N.** by **W.** from Pumpkin Island Lighthouse. It is about 1¼ miles long in a **NNE.** direction, and ¼ mile wide. It has good anchorage in 8½ to 8½ fathoms of water in the middle of the harbor just above a small islet on the west side inside the entrance.

Horseshoe Cove is a long, narrow cove, the entrance to which lies **NW.** by **N.** from Pumpkin Island Lighthouse; it is not navigable for any but the smallest class of vessels.

Anchorages.—Vessels can anchor anywhere in the reach where the water is not too deep and where the bottom is soft, making a lee of either shore, according to the direction of the wind.

Tides.—The mean rise and fall of tides is about 10 feet (see table, page 27).

SAILING DIRECTIONS, EGGEMOGGIN REACH.

1. *Entering from Eastward.*—Having followed the directions for Casco Passage, par. III, page 97, or for Blue Hill Bay, section 1, page 91, when about 500 yards westward of Devils Head Ledge buoy and Channel Rock buoy (spar, black, No. 3) is on the port beam, distant about 200 yards, steer **NNW.** ¾ **W.** for Torry Castle beacon; leave Devils Head about 350 yards on the starboard hand and Conary Island about 500 yards on the port hand. Leave Conary Ledge buoy (spar, black, No. 5) about 250 yards on the port hand, and when ¼ mile past the buoy steer **NW.** until Torry Castle beacon is distant about 600 yards and in range with the northern end of Torry Islands. Then steer **NNW.** ¼ **W.** nearly 2½ miles, and when Stump Cove Ledge buoy (nun, red, No. 8) bears *E.*, distant about ¼ mile, steer **NW.** ⅝ **W.** so as to leave Byard Point 250 to 300 yards on the starboard hand. When Byard Point buoy (spar, red, No. 12) has been passed about ⅝ mile, and the vessel is 300 yards from the shore of Byard Point, steer **NW.** ¾ **N.** and proceed as directed in section 2 following.

Remarks and dangers.—On the **NNW.** ¾ **W.** course Torry Castle beacon will show prominently ahead, and Conary Island will be on the port bow; when the island is abeam Conary Ledge buoy should be seen on the port bow.

Hay Island Ledge, a small, detached, rocky shoal with 7 feet of water on it, on the eastern side of the entrance to the reach, about ½ mile **SE.** by **S.** from Devils Head, is marked by a buoy (spar, red and black horizontal stripes).

Devils Head Ledge, with spots bare at low water, makes out ¼ mile southeastward from Devils Head, and is marked by a buoy (nun, red, No. 4), placed 200 yards southward of it.

Channel Rock, with 2 feet of water on it, is marked on its northeastern side by a buoy (spar, black, No. 3); the rock lies about ½ mile **S.** by **W.** ¾ **W.** from Devils Head, and on the western side of the channel.

The Boulders, bare at low water, lie about ¼ mile **NW.** by **W.** ¼ **W.** from Channel Rock.

Conary Ledge, a rocky shoal with 4 feet of water on it, lies a little over ⅝ mile **N.** by **W.** ¼ **W.** from the northern and highest point of Conary Island; it is marked by a buoy (spar, black, No. 5) placed **NE.** from it.

On the **NW.** course Eleven-Foot Spot buoy will be on the starboard bow, and should be left 200 yards on the starboard hand. Torry Castle beacon bears **E.** ½ **N.** when in range with the north end of Torry Islands.

Eleven-Foot Spot lies about 300 yards **S.** ¼ **W.** from Torry Castle beacon; it has 12 feet over it, and is marked on its southwestern side by a buoy (spar, red, No. 0).

Torry Castle is a bare rock with a large red tripod beacon; the channel is westward of the rock, which should be given a berth of at least 75 yards.

The **NNW.** ¼ **W.** course, when about ⅞ mile above Torry Castle beacon, leads 500 yards from the shore on the port hand. When nearly 1½ miles above Torry Castle beacon, Bridges Point Shoal buoy will be left nearly 500 yards on the starboard beam. Stump Cove Ledge buoy should be made on the starboard bow, and when the course is changed to **NW.** ⅝ **W.** this buoy will be open southward of the north point at the entrance to Benjamin River.

Torry Ledge is the northernmost of the rocky shoals making northward from Torry Island, and lies ⅝ mile **N.** by **E.** ½ **E.** from Torry Castle beacon; it has 2 feet of water on it and is marked by a buoy (spar, red, No. 4½).

A rocky shoal, with 15 feet over it, lies ¾ mile **N.** by **W.** ¼ **W.** from Torry Castle beacon.

Bridges Point Shoal, a 11-foot rocky shoal and the outermost of the shoals making off from the point, lies nearly ½ mile **SW.** by **W.** ½ **W.** from Bridges Point, the point about 1⅝ miles northwest from the entrance to Center Harbor. It is marked by a buoy (spar, red, No. 6) on the western end of the shoal.

Stump Cove Ledge, with 3 feet of water on it, makes out ⅝ mile westward from the northern side of the entrance to Benjamin River. It is marked on its southwestern end by a buoy (nun, red, No. 8).

On the **NW.** ⅝ **W.** course Byard Point will be a little on the starboard bow, and Sixteen-Foot Spot buoy should be left 300 yards on the port hand. As Byard Point is approached, the steamboat landing at Sargentville will be seen on the north shore, and Byard Point buoy will will be seen on the starboard bow; this buoy and the shore of Byard Point should be given a berth of about 250 yards.

Sixteen-Foot Spot lies 500 yards **ENE.** from Tinker Ledges buoy, and is marked by a buoy (spar, black, No. 7).

Closson Ledges and **Tinker Ledges** make off nearly ⅜ mile from the shore of Deer Isle west from the entrance to Benjamin River. They have several spots showing bare at half tide, and are marked off their northeastern end by Tinker Ledges buoy (spar, black, No. 7½).

A red spar buoy, No. 10, marks a rock off the eastern shore below the steamboat landing at Sargentville in the entrance to Billings Cove. There is no channel inshore of this buoy.

A shoal makes off from the southern end of Byard Point for a distance of 200 yards, and is marked at its end by a buoy (spar, red, No. 12).

Little Sally is a bare rock, surrounded on all sides by sunken ledges which make off 300 yards from the shore of Deer Isle, opposite Byard Point. The rock should be given a berth of at least 125 yards, passing eastward of it.

2. *From Byard Point to East Penobscot Bay.*—When about ⅜ mile northwestward of Byard Point buoy (spar, red, No. 12) and about 300 yards from the shore of Byard Point, steer **NW. ¾ N.** until Pumpkin Island Lighthouse bears *SW. ¾ W.* Then steer **W.** until Pumpkin Island Lighthouse bears **SE.** by **S.**, and then—

If bound up Penobscot Bay, steer **WSW.**, leaving Pumpkin Island Ledge buoy (spar, black, No. 15) 300 yards on the port hand and Spectacle Island Ledge buoy (spar, red, No. 14) 150 yards on the starboard hand. When Spectacle Island Ledge buoy bears *N.*, distant 200 yards, steer **W. ¾ N.** until Spectacle Island is ½ mile distant on the starboard quarter. Then steer **WNW. ½ W.**, and when the western end of Cape Rosier bears *NE.*, steer **N.** by **E. ½ E.** and follow the directions in section 3, "Sailing Directions, East Penobscot Bay."

Bound across Penobscot Bay or to Rockland, when Pumpkin Island Lighthouse bears *SE.* by *S.* steer **SW.** by **W.**, and leave Pumpkin Island Ledge buoy (spar, black, No. 15) 200 yards, and Two Bush Ledge buoy (spar, red and black horizontal stripes) 250 yards, on the port hand. Then follow the directions in section 3.

Remarks and dangers.—On the **NW. ¾ N.** course Howard Ledges buoy (spar, black, No. 9) will be left 350 yards, and The Triangles buoy (spar, black, No. 11) 400 yards, on the port hand.

Howard Ledges is a rocky shoal ⅜ mile long in a **NNW.** and **SSE.** direction, lying off the shore of Little Deer Isle about 1¼ miles above Byard Point; it has from 1 to 9 feet of water on it and is marked on its northern end by a buoy (spar, black, No. 9).

The Triangles are three ledges forming a triangle off the northern end of Little Deer Isle, with from 2 to 9 feet of water on them. They are marked by two buoys (spars, black, Nos. 11 and 13) lying about **NE.** by **E.** distant, respectively, 900 and 600 yards from Pumpkin Island Lighthouse.

On the **W.** course **Spectacle Island** (about 40 feet high and bare of trees) will be ahead; The Triangle Ledges buoys (spars, black, Nos. 11 and 13) will be left about 400 yards, and Pumpkin Island Lighthouse about ⅜ mile, on the port hand.

Pumpkin Island Ledge, a small, detached rock with 10 feet of water on it, lies ⅜ mile **NW. ½ W.** from Pumpkin Island Lighthouse, and is marked by black spar buoy No. 15.

On the **WSW.** course Thrumbcap Ledge will be left nearly ¼ mile on the starboard hand; Merriman Ledge buoy (spar, black, No. 17) will be left 600 yards, and Two Bush Ledge buoy ⅜ mile, on the port hand.

Thrumbcap Ledge is an unmarked rocky shoal, with a few heads bare at high water, lying ¼ mile **NW.** from Pumpkin Island Lighthouse.

A rocky ledge with a least depth of 15 feet over it lies in the middle of the channel about ⅞ mile **W. ½ N.** from Pumpkin Island Lighthouse. This ledge is not marked, and is dangerous for vessels of 13 feet draft at lowest tides.

Spectacle Island Ledge is a small ledge with 6½ feet of water on it, lying 1⅓ miles **W.** by **N.** from Pumpkin Island Lighthouse; it is marked on its southwestern end by a buoy (spar, red, No. 14).

On the **W. ¾ N.** course **Spectacle Island** should be left 400 yards on the starboard hand; **Blakes Point**, the southern end of Cape Rosier, will be left about ⅜ mile on the starboard hand.

Shoals surround Spectacle Island and the small island just westward of it; they are avoided by giving the southern side of the islands a berth of at least 250 yards.

On the **SW.** by **W.** course, after passing Pumpkin Island Ledge buoy (spar, black, No. 15), Merriman Ledge buoy (spar, black, No. 17) will be left well on the port hand, and Two Bush Ledge buoy should be made a little on the port bow; Fiddle Head and **Hog Island**, the latter grassy with a farmhouse near its highest point, will be a little on the starboard bow.

Merriman Ledge, bare at low water only, lying ⅜ mile **W. ¼ N.** from Pumpkin Island Lighthouse, is marked on its northern end by a buoy (spar, black, No. 17).

Two Bush Ledge, with 4½ feet of water on it, lies nearly 1 mile **WSW. ¾ W.** from Pumpkin Island Lighthouse; it is marked on its western side by a buoy (spar, red and black horizontal stripes).

3. *From Eggemoggin Reach to Rockland, crossing Penobscot Bay.*—When Two Bush Ledge buoy bears *E.*, distant 300 yards, steer **SW. ¼ W.**, and when the western edge of Hog Island is in range with the western edge of Western Island bearing *NW. ¼ W.*, change the course to **SW.** by **W.** When midway between Great Spruce Head Island and Beach Island steer **W. ¼ S.** passing midway between Horse Head and Little Spruce Head islands. When Little Spruce Head Island bears *S.*, distant 600 yards, steer **SW. ¾ W.**, for 6¾ miles until McIntosh Ledge buoy (nun, red and black horizontal stripes) is in range with Robinson Rock. Then steer **W.** by **S.** if bound to Rockland, or **SW.** by **W. ½ W.** if bound through Muscle Ridge Channel, and follow the directions given under headings "Rockland Harbor" or "Muscle Ridge Channel," according to destination.

Remarks and dangers.—The **SW. ¼ W.** course leads a little over ¼ mile eastward of Fiddle Head and Hog Island. **Western Island** is the second large island northwestward of Hog Island; **Green Ledge**, a small grassy island, will be first opened westward of Hog Island, and Western Island will be opened soon afterwards on the **SW. ¼ W.** course.

Fiddle Head is a bare, rocky isle with steep faces, lying northeastward of Hog Island and joined to it by shoals bare at low water. Shoals make out 200 yards southward of it.

On the **SW.** by **W.** course the western end of **Great Spruce Head Island**, high, bare, white, and rocky, will be ahead. **Beach Island**, grassy, high at both ends and low in the middle, with its northwestern end wooded, will be left about ⅜ mile on the starboard hand; shoals extend about 250 yards from the eastern end of Beach Island. An unmarked 11-foot shoal spot lies 400 yards **NE.** from the northeastern end of Great Spruce Head Island.

On the **SW. ¾ W.** course, **Compass Island**, a small, rocky isle about 40 feet high, and **Egg Rock** will be left about ¾ mile on the port hand. When McIntosh Ledge buoy is in range with **Robinson Rock**, the southernmost of the islands and bare rocks extending southwestward from South Islesboro, McIntosh Ledge buoy should be over ⅜ mile distant on the starboard hand, bearing **NW. ¾ W.**

Egg Rock is a small, bare rock, about 15 feet out of water, and surrounded by deep water; it lies nearly 1¾ miles **SW. ¼ W.** from Compass Island.

Egg Rock Ledge is small, has 5 feet over it, and lies ⅜ mile **SSW. ¾ W.** from Egg Rock. It is marked by a buoy (spar, red and black horizontal stripes).

McIntosh Ledge is a small rock with 2 feet over it and surrounded by deep water, lying nearly ¾ miles **SE.** by **E.** from Robinson Rock and 5¼ miles **NE.** by **E. ½ E.** from Owls Head Lighthouse. The ledge is marked by a buoy (nun, red and black horizontal stripes) placed off its southwestern side.

CASCO PASSAGE, YORK NARROWS, AND JERICHO BAY.*

Northward of Swan Island, between it and Johns, Calf, and Black islands, there is a narrow passage which separates into two branches in its western part. The eastern end and northern branch is known as **Casco Passage**, the southern branch as **York Narrows**. North of Pond Island there is a much deeper and wider passage (see sailing directions, pp. 91–92) connecting Blue Hill and Jericho bays. They all form a part of the different inland passages from Mount Desert to Whitehead. Casco Passage and York Narrows are well marked by buoys, and at the eastern entrance, on the northern part of Orono Island, there is a large black tripod. Casco Passage is the straighter and has the better water.

Vessels of 16 feet draft have been taken through, but the usual draft is 10 to 12 feet; strangers of over 12 feet draft are advised to take a pilot, stopping for one at Southwest Harbor or Bass Harbor. Sailing directions are given for Casco Passage. Vessels using York Narrows should be guided by the buoys; there are two rocks with 6 and 10 feet of water over them, respectively, which make its navigation dangerous for strangers.

On the eastern shore of the broad bight in the north side of Swan Island is the post village of **Atlantic**. The bight is sometimes used by fishermen for an anchorage, but it contains many ledges.

Jericho Bay is the body of water westward of Marshalls and Swan islands and is the approach from eastward to Eggemoggin Reach, Deer Island Thorofare, and Merchants Row. It has deep water, but there are many ledges, rocks, and small islands which make its navigation hazardous to a stranger. The dangers can

*Shown on charts **103**, scale $\frac{1}{80,000}$, price $0.50; **307, 308**, scale $\frac{1}{40,000}$, price of each $0.25.

be avoided by studying U. S. Coast and Geodetic Survey charts 308 and 309; a detailed description of them would be confusing on account of their number. Approaching Jericho Bay from southward it is advisable to pass between Marshalls and Swan islands, where the dangers are well marked. The western passage between Marshalls Island and Isle au Haut is obstructed by a number of unmarked sunken ledges, and should not be attempted without a pilot.

Tidal currents.—The flood sets eastward and the ebb westward through Casco Passage. The velocity of the currents is influenced greatly by strong winds.

SAILING DIRECTIONS, ACROSS BLUE HILL BAY, THROUGH CASCO PASSAGE, AND ACROSS JERICHO BAY.

These directions are good for vessels of 12 feet draft in the daytime with clear weather when the buoys can be seen. Vessels of greater draft should take a pilot. The directions from westward are given only from Merchants Row and Deer Island Thorofare, they being the ones generally used and most difficult to reverse.

1. ***From Eastward and through Casco Passage.***—Having crossed Bass Harbor Bar, as directed in the Sailing Directions for Bass Harbor, page 83, bring Bass Harbor Head Lighthouse to bear *E.* and steer **W.**; pass about 350 yards south of Black Island, and when the tripod on Orono Point bears *SSW.*, distant about 400 yards, steer about **NW.** by **W.** ¾ **W.** for red spar buoy No. 2, leaving black spar buoy No. 3 on the port hand. Leave red spar buoy No. 2 on the starboard hand and steer **WNW.** ½ **W.**; pass just northward of black spar buoy No. 5, and then steer a little more westward, leaving black spar buoy No. 7 about 50 yards on the port hand; when this buoy is abeam steer **W.** ½ **S.**, passing about 200 yards south of Casco Passage Ledge buoy (spar, red, No. 4), and when this buoy bears *NE.* by *N.*, distant about 300 yards, follow the directions in section 2, according to destination.

Remarks and dangers.—On the **W.** course across Blue Hill Bay no dangers will be encountered until the entrance of Casco Passage is approached. **Black Island**, dark and wooded, will be a little on the starboard bow and the entrance to Casco Passage will be ahead. Orono Point tripod, black, will be made on the port bow and the buoy (can, black, No. 1) northward of it will be made and should be left on the port hand. The buoys marking the channel through York Narrows will be seen southwestward.

In Casco Passage the buoys should be closely followed, as shoals and ledges, a description of which would be useless, lie on both sides of the channel. At low water several ledges will be seen between Casco Passage and York Narrows. On the **NW.** by **W.** ¾ **W.** course red spar buoy No. 2 should be a little on the starboard bow, and two black spar buoys will be seen on the port bow farther westward; these buoys must be passed close-to as the channel is narrow eastward of black spar buoy No. 7.

Casco Passage Ledge is about 200 yards in diameter, has a least depth of 10 feet over it, and lies at the western entrance to Casco Passage, about ⅝ mile **SW.** ½ **S.** from the southwestern point of Johns Island. The channel leads south of the ledge, which is marked off its southern end by a buoy (spar, red, No. 4).

2. ***From Casco Passage across Jericho Bay.***—*I. To Deer Island Thorofare.*—With Casco Passage Ledge buoy (spar, red, No. 4) bearing *NE.* by *N.*, distant 300 yards, steer **W.** ½ **S.**; pass at least 250 yards northward of Egg Rock beacon, and when past this beacon steer **W.** ½ **S.** for Long Ledge buoy (spar, red, No. 2), which is left close-to on the starboard hand; then follow the directions in section 1, under heading "Deer Island Thorofare," page 100.

Remarks and dangers.—On the **W.** ½ **S.** course for the entrance to Deer Island Thorofare, **Eastern Mark Island**, rocky and about 300 yards in diameter, will be ahead. **Shabby Island**, a small rocky island with a remarkable scraggy tree, lying ⅞ mile **ESE.** from Eastern Mark Island, will be on the port bow. The beacon on Egg Rock will be on the port bow; when past this beacon Long Ledge and the red tripod beacon marking it will be seen a little on the starboard bow, and the buoy (spar, red, No. 2) on the southern end of the ledge will be ahead.

Egg Rock, marked by a beacon (wooden tripod, red) is a small bare rock surrounded by ledges; it lies 1⅛ miles **SW.** by **W.** ½ **W.** from the southwestern point of Johns Island and the ledges are avoided by giving the beacon a berth of 300 yards.

A shoal, with a least depth of 11 feet and about 250 yards long in a **N.** and **S.** direction, lies ⅝ mile **E.** from Long Ledge beacon, and northward of the sailing line approaching the entrance to Deer Island Thorofare.

A small spot with 18 feet of water over it lies ⅝ mile **SSE.** ¼ **E.** from Long Ledge beacon.

Long Ledge is an extensive ledge on the north side at the eastern entrance to Deer Island Thorofare. A part of the ledge near its southern end is bare and is marked by a red tripod beacon. The southern end of the ledge is marked by a buoy (spar, red, No. 2).

II. To Merchants Row.—With Casco Passage Ledge buoy (spar, red, No. 4) bearing *NE.* by *N.*, distant 300 yards, steer **SW.** about 1 mile; Swan Island Head will then be on the port beam and Sunken Egg Rock buoy (spar, red and black horizontal stripes) about 600 yards on the starboard beam. From this position steer **SW.** by **W.** ½ **W.**; leave The Woodbury buoy (spar, red and black horizontal stripes) about 600 yards on the port hand and Whaleback Ledge buoy (spar, red, No. 2) about ½ mile on the starboard hand; the course leads about midway between Southern Mark Island and *Southern Mark Island Ledge*, a small bare rock, surrounded by ledges, about ¾ mile northward of the island. When the spindle on Colby Ledge bears on the starboard beam, distant about 500 yards, follow the directions in section 1, under heading "Merchants Row," page 102.

Remarks.—On the **SW.** course the beacon on Egg Rock and the buoy on Sunken Egg Rock will be broad off the starboard bow. On the **SW.** by **W.** ½ **W.** course, **Southern Mark Island,** small, with smooth rocky faces, will be on the port bow; the sailing line leads about ⅝ mile northward of the island. Vessels entering Merchants Row from southward, without a pilot, should enter Jericho Bay between Marshalls and Swan islands (see section 1, page 98).

Dangers.—**Sunken Egg Rock** is a small cluster of rocks, with 8 to 18 feet of water over them, lying ⅝ mile **SW.** by **S.** from Egg Rock beacon. The ledge is marked by a buoy (spar, red and black horizontal stripes) and can be avoided by giving the buoy a berth of 300 yards.

Hanus Ledge is a small 9-foot spot, marked by a buoy (spar, black, No. 1) lying nearly ¼ mile off the western shore of Swan Island and 1¼ miles **S.** by **W.** from Egg Rock beacon.

The Woodbury is a small 10-foot spot lying 1¾ miles **SW.** ½ **S.** from Egg Rock beacon and nearly 1 mile off the western shore of Swan Island; it is marked by a buoy (spar, red and black horizontal stripes) which is left on the port hand standing for the entrance to Merchants Row.

Whaleback Ledge, bare at half tide and marked by a buoy (spar, red, No. 2), lies 2⅝ miles **SW.** by **W.** ½ **W.** from Egg Rock beacon and about 1⅛ miles **E.** from Saddleback Island. The buoy is placed southeast of the ledge, which is about 150 yards in diameter and has good water all around it.

West Halibut Rock has 2 feet of water over it and lies a little over 1¾ miles **NW.** by **W.** ¾ **W.** from the northern end of Marshalls Island. The rock is marked by a buoy (spar, red and black horizontal stripes); about 400 yards **ENE.** from this is a small rock with 9 feet over it; there is deep water around and between these rocks.

Colby Ledge and other dangers in Merchants Row are described on page 102.

III. To Eggemoggin Reach.—With Casco Passage Ledge buoy (spar, red, No. 4) bearing *NE.* by *N.*, distant 300 yards, steer **NW.** ½ **N.**; leave Hay Island Ledge buoy and Devils Head Ledge buoy on the starboard hand and Channel Rock buoy (spar, black, No. 3) on the port hand and follow the directions in section, 1 under heading "Eggemoggin Reach," page 93.

Remarks.—On the **NW.** ½ **N.** course Devils Head (see description, page 99) will be a little on the starboard bow. Hay Island Ledge, Devils Head Ledge, and Channel Rock are described on page 93.

1 A. ***From Westward, across Jericho Bay and through Casco Passage.***—*I. From Deer Island Thorofare.*—Having followed the directions in section 1 A, "Sailing Directions, Deer Island Thorofare," page 100, when Long Ledge buoy (spar, red, No. 2) is 100 yards on the port beam, steer **E.** ½ **N.**, taking care not to be set northward; pass about 300 yards northward of Egg Rock beacon and continue the **E.** ½ **N.** course, leaving Casco Passage Ledge buoy (spar, red, No. 4) about 200 yards on the port hand.

When up to black spar buoy No. 7 leave it on the starboard hand and follow the buoys in Casco Passage, leaving the black spar buoys on the starboard hand and red spar buoy No. 2 on the port hand. From black can buoy No. 1, which should be left about 200 yards on the starboard hand, steer **E.** for Bass Harbor Head Lighthouse, and reverse part of the directions in section 1, page 96.

Remarks.—On the **E.** ¼ **N.** course from Deer Island Thorofare, Egg Rock beacon will be a little on the starboard bow; as the beacon is approached haul northward so as to leave it 300 yards on the starboard hand. After passing the beacon a sharp lookout should be kept for Casco Passage Ledge buoy, which is left on the port hand. The black buoys marking the south side of the channel of Casco Passage will then be seen a little on the starboard bow.

II. From Merchants Row.—Having followed the directions in section 1 A, "Sailing Directions, Merchants Row," page 103, when the spindle on Colby Ledge bears *N.*, distant about 500 yards, steer **NE.** by **E.** ½ **E.**, passing about ⅜ mile northward of Southern Mark Island. West Halibut Rock buoy will be left about ½ mile on the starboard hand and Whaleback Ledge buoy the same distance on the port hand. The Woodbury buoy will be left about ¼ mile on the starboard hand and Sunken Egg Rock buoy about the same distance on the port hand. When up to Sunken Egg Rock buoy, steer **NE.** by **E.** ¼ **E.**, and when black spar buoy No. 7 is made, shape the course so as to leave it about 100 yards on the starboard hand; when up to this buoy follow the directions in the preceding paragraph.

Remarks.—On the **NE.** by **E.** ¼ **E.** course from Merchants Row the buoys on both sides of the sailing line should be passed as directed above. Egg Rock beacon will be made on the port bow and the entrance to Casco Passage will be ahead.

After passing Egg Rock beacon a sharp lookout should be kept for the buoys at the entrance to the passage.

For dangers see paragraphs I and II of section 2, preceding.

SAILING DIRECTIONS, TO ENTER JERICHO BAY FROM SEAWARD.

These directions lead in a least depth of over 5 fathoms.

1. Follow the directions in section 1 or 1 A, "Sailing Directions, Burnt Coat Harbor," pages 85–86, until midway between Green and Brimstone islands, then steer **NW.** ¼ **N.**; pass 400 yards northward of Ringtown Island, and give the extreme northern point of Marshalls Island a berth of at least ⅜ mile. When midway between Hat Island and Halibut Rocks—

If bound to Eggemoggin Reach, steer **N.** ½ **E.**; The Woodbury buoy (spar, red and black horizontal stripes) will be left 300 yards on the port hand, Sunken Egg Rock buoy and Egg Rock beacon will be left well on the starboard hand, and Green Island Ledge buoy (spar, black, No. 1) will be left ¼ mile on the port hand. Devils Head will be made on the port bow, and when its highest point bears **N.** by **W.**, steer for it on the bearing. Pass about midway between Hay Island Ledge buoy (spar, red and black horizontal stripes) and Channel Rock buoy (spar, black, No. 3), and follow the directions in section 1, "Sailing Directions, Eggemoggin Reach," page 93.

If bound through Deer Island Thorofare, steer **N.** by **W.** ¼ **W.**, with Long Ledge tripod beacon ahead; leave The Woodbury buoy (spar, red and black horizontal stripes) about 350 yards on the starboard hand. Long Ledge buoy (spar, red, No. 2) will be made ahead; when 100 yards distant from the buoy, steer **W.** by **N.** and follow the directions in section 1, "Sailing Directions, Deer Island Thorofare," page 100.

If bound through Merchants Row, steer **WNW.** ½ **W.**, with the highest part of Spruce Island ahead, and pass about ¼ mile northward of Halibut Rocks beacon and nearly ⅜ mile northward of West Halibut Rock buoy (spar, red and black horizontal stripes). When this buoy is about abeam, and Southern Mark Island bears *SW.* by *W.*, steer **WSW.** ½ **W.**, passing nearly ⅜ mile northward of Southern Mark Island (midway between the island and Southern Mark Island Ledge). Colby Ledge spindle should be made on the starboard bow, and Colby Pup buoy (spar, red and black horizontal stripes) on the port bow; pass about ¼ mile southward of the spindle and follow the directions in section 1, "Sailing Directions, Merchants Row," page 102.

Remarks and dangers.—The principal dangers are described on pages 96–97.

On the **N. ½ E.** course Devils Head should be a little on the port bow; Long Ledge beacon should be left ⅛ mile on the port hand and Egg Rock beacon ¾ mile on the starboard hand. A shoal with 11 feet over it lies ⅝ mile **E.** from Long Ledge beacon.

Green Island Ledge is an extensive shoal, lying between ½ and 1 mile northeastward of Long Ledge beacon, portions of which show at all times and a large part of which is bare at low water. Its eastern end is marked by a buoy (spar, black, No. 1), lying 1 mile **NE. ½ E.** from Long Ledge beacon, and ¾ mile **SE. ½ E.** from Crow Island.

Devils Head when seen from southward appears as a high, rocky hill with steep, bare faces. It is on the southern end of Hog Island and marks the eastern side of the entrance to Eggemoggin Reach.

DEER ISLAND THOROFARE.*

This thorofare, leading from Jericho Bay into East Penobscot Bay, passes between the southern shore of Deer Isle and the numerous islands to the southward. It is one of the chain of inland passages, and is used by vessels bound across Penobscot Bay. The eastern entrance is 1¾ miles **W.** from Egg Rock beacon and leads south of Long Ledge, which is bare and marked by a large red tripod beacon, and red spar buoy No. 2 off its southern end. A small, bare island (**Shabby Island**), with a lone ragged tree on it, is a conspicuous mark on the southern side of the entrance; there is a ledge ⅝ mile eastward of this island. The western entrance can be distinguished by Mark Island with Deer Island Thorofare Lighthouse on its western end.

The channel through this thorofare can be easily followed in the daytime, when the buoys can be readily distinguished, and with a leading wind, although it is very narrow—in places not over 75 yards wide. Most of the dangers are buoyed. The least water is on the bar between Moose Island and Crotch Island, and it is not safe to pass this point at low water drawing more than 10 feet. Vessels of 16 feet draft have been taken through at high water.

Southeast Harbor lies northwestward of the eastern end of the thorofare, between Stinsons Neck on the east and Whitmores Neck on the west. The entrance is easily distinguished and the dangers are marked by buoys. It is an excellent anchorage, and at **Oceanville**, a village on the western shore, some ship-chandler's stores, fresh water, and at times a limited supply of coal, can be obtained. Pilots for the thorofare can be found here.

Stonington is a small town at the head of a shallow cove in the south shore of Deer Isle, near the western entrance of the thorofare. It has steamboat communication with Rockland and is the headquarters for the large granite quarries on the adjacent islands.

Anchorages.—The best anchorage for vessels bound through the thorofare and overtaken by night or bad weather is Southeast Harbor. When overtaken by fog they may anchor anywhere near the channel where they find soft bottom and a suitable depth of water. There is a limited anchorage on the northern edge of the channel abreast Stonington.

Ice closes the thorofare and Southeast Harbor for about one month each winter.

For **tides** see table, page 27.

Currents.—The tidal currents follow the general direction of the channel and are not strong. The direction of the currents is influenced by the wind; with strong easterly winds both the flood and ebb set westward, and with westerly winds they set eastward. When not influenced by the wind the flood sets eastward and the ebb westward, and continues to run about ¾ hour after high and low waters.

SAILING DIRECTIONS, DEER ISLAND THOROFARE.

These directions are good for a draft of 10 feet at low water and 15 feet at high water in the daytime with clear weather, when the buoys and other guides can be seen. Vessels of greater draft can be taken through at high water, but it is advisable to take a pilot. Close attention must be given to the directions. The rocks and ledges on both sides of the channel are so numerous that a detailed description of them would only confuse the navigator.

*Shown on charts **104**, scale $\frac{1}{80,000}$, price, $0.50; **309**, scale $\frac{1}{40,000}$, price $0.25.

1. ***Entering from Eastward.***—Having followed the directions in section 1, page 91 or 98, or section 2, page 96, when Long Ledge buoy bears *N.*, distant 50 to 100 yards, steer about **W.** by **N.** so as to pass about 75 yards north of Potato Ledge buoy (spar, black, No. 0), 75 yards south of Lazygut Ledge buoy (spar, red, No. 4) and 100 yards north of Eastern Mark Island Ledge buoy (spar, black, No. 3). Eastern Mark Island Rock buoy (spar, black, No. 1) will be left a little over ¼ mile on the port hand. When black spar buoy No. 3 is a little abaft the port beam, steer about **SW.** by **W.** ½ **W.** so as to pass about midway between *Haycock Rock* spindle and *Shelldrake Rock*, the small whitish islet northwestward of the spindle, and when between them steer about **W.** ½ **S.** so as to leave White Rock and Haskell Ledge buoys (spars, red, Nos. 6 and 8) on the starboard hand and Bold Island Ledges buoys, eastern and western, (spars, black, Nos. 5 and 7), on the port hand; the course leads about 200 yards *S.* of Grog Island.

When the eastern end of Grog Island bears *N.*, steer about **W.** by **S.** for the middle or highest point of Russ Island, and when *Humpkins Island*, small, rocky islet nearly ½ mile west of Grog Island, bears *N.*, distant about 450 yards, steer about **W.** ⅜ **N.** so as to pass north of Russ Island Ledge buoy (spar, black, No. 9), which should be left close-to, and south of Dow Ledge buoy and Staples Ledge buoy (spars, red, Nos. 12 and 14). Leave Two Bush Island Point buoy (spar, black, No. 0) about 200 yards on the port hand, *Two Bush Islands*, a group of small, rocky islets, about 150 yards on the port hand, *Thurlow Knob*, the small, rocky island off the northeast end of Crotch Island, about 100 yards on the port hand, and pass 40 yards north of Thurlow Knob Ledge buoy (spar, black, No. 11). Stonington is at the head of the bight north of Two Bush Islands. When black spar buoy No. 11 is abeam steer about **WSW.** ¾ **W.**; leave Crotch Island Ledge buoy (spar, black, No. 13) on the port hand and Gangway Rock buoy (spar, red and black horizontal stripes) on the starboard hand. Field Ledge buoy (spar, black, No. 15) should be made nearly ahead and left about 70 yards on the port hand; Mark Island will be left about 250 yards on the port hand, then—

Bound through Fox Islands Thorofare.—When westward of Mark Island bring Deer Island Thorofare Lighthouse to bear *E.* by *S.* and steer **W.** by **N.** for the entrance to Fox Islands Thorofare and follow the directions in section 1, "Sailing Directions Fox Islands Thorofare," page 104.

Bound up to East Penobscot Bay.—When north of Mark Island, steer about **NW.** and leave Mark Island Ledge buoy (spar, red, No. 2) about 600 yards on the port hand. When in the middle of the bay, follow the directions in section 2, "Sailing Directions, East Penobscot Bay," page 109.

1 A. ***Entering from Westward.***—Having followed the directions in section 1 A, "Sailing Directions, Fox Islands Thorofare," page 105, when the bell buoy off Channel Rock bears *N.*, distant 200 yards, steer **E.** by **S.** for Deer Island Thorofare Lighthouse (see table, page 16). Pass 250 yards *N.* of the lighthouse and steer **ENE.** ¾ **E.**; leave black spar buoy No. 15 about 60 yards on the starboard hand, the red and black horizontally-striped spar buoy on the port hand, and black spar buoy No. 13 on the starboard hand. When past these buoys continue the course until Thurlow Knob bears *S.*, and black spar buoy No. 11 is about 40 yards on the starboard beam. Then steer **E.** ⅜ **S.**, and leave black spar buoy No. 0 on the starboard hand, red spar buoys Nos. 14 and 12 on the port hand, and black spar buoy No. 9 on the starboard hand.

Continue the **E.** ⅜ **S.** course about ½ mile past black spar buoy No. 9, with the north end of Bold Island a little on the starboard bow, and when Humpkins Island bears *N.*, steer **E.** by **N.** to pass about 200 yards south of Grog Island. When the eastern end of Grog Island bears *N.*, steer **E.** ½ **N.**; leave the two black spar buoys, Nos. 7 and 5, on the starboard hand, and the two red spar buoys, Nos. 8 and 6, on the port hand, heading so as to pass about 200 yards north of the spindle on Haycock Rock. When this spindle bears *S.* distant about 200 yards, steer **NE.** by **E.** ½ **E.**, and pass northward of black spar buoy No. 3; bring it to bear *S.*, distant 200 yards, and steer **E.** by **S.**; leave red spar buoy No. 4 about

75 yards on the port hand, black spar buoy No. 0 about 75 yards on the starboard hand, and red spar buoy No. 2 (Long Ledge buoy) about 50 to 100 yards on the port hand, then—

Bound through Casco Passage.—Follow the directions in section 1 A, page 97.

Bound to Blue Hill Bay.—Steer **E.** until within ½ mile of Egg Rock beacon, then steer **NE. ¾ N.**, passing a little over ¼ mile eastward of Mahoneys Island with Channel Rock ahead. When Lamp Island bears **E.** by **S.** steer **ENE. ¼ E.** for red spar buoy No. 2, and follow the directions in section 1 D, page 89.

Bound to Burnt Coat Harbor.—Steer **S.** by **E. ¼ E.**, with Long Ledge beacon astern and heading so as to pass about midway between Hat Island and Halibut Rocks; when on a line midway between them, follow the directions in section 1 B, "Sailing Directions, Burnt Coat Harbor," page 86.

SAILING DIRECTIONS, SOUTHEAST HARBOR.

These directions lead to the anchorage in 3¼ to 8 fathoms water off the village of Oceanville, and are good for vessels of 20 feet draft.

1. ***Entering from Eastward.***—Having followed the directions in section 1, page 91 or 98, or section 2, page 96, until up to the eastern entrance to Deer Island Thorofare, when Long Ledge buoy (spar, red, No. 2) bears *N.*, distant 50 to 75 yards, steer **W.** by **N.**; pass 75 yards north of Potato Ledge buoy (spar, black, No. 0), and about 100 yards south of Lazygut Ledge buoy (spar, red, No. 4), and when this buoy bears well on the starboard quarter steer **NW. ½ W.** Pass about 350 yards eastward of Boat Rock buoy (spar, red and black horizontal stripes) and the same distance eastward of Whaleback Ledge buoy (spar, black, No. 1). When nearly up to the latter buoy steer more northward and anchor in the middle of the harbor, taking care to avoid the small 11-foot spot which lies ½ mile *NE. ¾ N.* from the highest point of the Whaleback.

1 A. ***Entering from Westward.***—Having followed the directions in section 1 A, "Sailing Directions, Deer Island Thorofare," until past Haycock Rock spindle, which is left on the starboard hand, when about midway between Eastern Mark Island Ledge buoy (spar, black, No. 3) and Shelldrake Rock, steer **N.** by **W. ¾ W.**; pass about midway between Boat Rock buoy and Sheep Island and about 350 yards eastward of Whaleback Ledge buoy (spar, black, No. 1). Anchor as directed in section 1, preceding.

MERCHANTS ROW.*

This passage leading from Jericho Bay to East Penobscot Bay and passing between the islands and ledges lying between Deer Island and Isle au Haut, is used by vessels in the winter, when Deer Island Thorofare is closed by ice, and by deep-draft vessels at all times. It is not so direct as Deer Island Thorofare, but the channel is wider, and has a depth sufficient for vessels of the deepest draft. There are numerous ledges and rocks on both sides of this passage, but the principal ones are marked by buoys or spindles, and the channel can be readily followed in clear weather and daylight. The entrance from eastward is indicated by Southern Mark Island, which can be passed on either side. At the western end is Deer Island Thorofare Lighthouse, the guide into Deer Island Thorofare and Merchants Row, the thorofare entrance being north of the lighthouse, and the entrance to Merchants Row south of it.

Prominent objects.—Southern Mark Island is about 300 yards long in a **NE.** and **SW.** direction, and about 150 yards wide; its appearance from northward and eastward is a small, brown island about 30 feet high and covered with grass; it lies 2⅛ miles **W. ½ S.** from Halibut Rock beacon. **Saddleback Island** is the large hilly island, with scattered trees, about 1½ miles north of Southern Mark Island; it has several smaller islands

*Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **309**, scale $\frac{1}{40,000}$, price $0.25.

around it. **McGlathery Island,** large, covered with trees, with a hill 100 feet high near its southern end, lies about **WNW.** from Southern Mark Island; the channel passes just south of it. **Farrells Island,** near the western part of the row, is partly wooded; it lies about 1 mile **SE.** from Mark Island (Deer Island Thorofare Lighthouse). About ½ mile **SW.** from Farrels Island is **Sparrow Island,** a grassy island about 25 feet high. The channel passes between them and then leads northwestward, south of Deer Island Thorofare Lighthouse. **Mark Island,** at the western entrance of Merchants Row, is covered with a growth of low trees, which partly hide the lighthouse on its western end when approaching from eastward.

The **tides** are practically the same as in Deer Island Thorofare (see table, page 27).

SAILING DIRECTIONS, MERCHANTS ROW.

These directions, if closely followed, will lead in the best water; a least depth of 5¼ fathoms will be found southward of Mark Island. Strangers should not attempt to pass through the Row except in the daytime and with clear weather.

1. *Entering from Eastward.*—Having followed the directions in section 1, page 98, or section 2, pages 96–97, when the spindle on Colby Ledge bears *N.*, distant about 500 yards, steer **W. ½ N.** and leave Gooseberry Island about 250 yards on the starboard hand. When the southwestern point of McGlathery Island is clear of Round Island, bearing about *NNE.*, steer **WNW. ¼ W.**, with Sparrow Island a little on the port bow. When the eastern end of Farrels Island is in range with the eastern or highest bare hill on Crotch Island, bearing about *NE.*, steer **NNW. ¾ W.**, heading about 400 yards westward of Deer Island Thorofare Lighthouse. When about midway between Mark Island and Scraggy Island—

Bound through Fox Islands Thorofare.—Steer **WNW. ¾ W.** about 4½ miles, when the bell buoy off Channel Rock should be about 150 yards on the starboard beam; then follow the directions in section 1, "Sailing Directions, Fox Islands Thorofare," page 104.

Bound up East Penobscot Bay.—Steer about **NW. ½ W.**, leaving Mark Island Ledge buoy (spar, red, No. 2) about 200 yards on the starboard hand, and when in the middle of the bay, follow the directions in section 2, "Sailing Directions, East Penobscot Bay," page 109.

Remarks and dangers.—On the **W. ½ N.** course, when passing southward of McGlathery Island, as soon as the southwestern point of the island is opened so as to show the whole of Round Island, just westward, the course should be changed to **WNW. ¼ W.**

Colby Ledge, bare at half tide, is on the north side of the channel, about 1 mile **WNW.** from the northern end of Southern Mark Island. The ledge is marked by a red iron spindle with wheel on top.

Colbys Pup, a small ledge with 3 feet over it, lies ¼ mile **S. ¾ W.** from the spindle on Colby Ledge; it is marked by a buoy (spar, red and black horizontal stripes) placed east of the ledge, which is about 150 yards in diameter. Keeping Halibut Rocks open northward of Southern Mark Island clears this ledge.

Middle Ledge, showing partly bare at low water, is about 200 yards long in a **NW.** and **SE.** direction, and lies nearly ¾ mile **S.** from Gooseberry Island and about ⅝ mile **SW.** by **W. ½ W.** from Colbys Pup. There are two spots with 16 and 18 feet over them, about 400 yards northwestward and northward of this ledge.

On the **WNW. ¼ W.** course the spindle on Barter Island Ledges should be left about 400 yards on the starboard hand; Harbor Island Ledge buoy should be left on the port hand. Mid Channel Ledge buoy can be left on either hand by giving it a berth of 200 yards; the sailing line passes south of it. **Ewe Island,** small and round, covered with trees on top, lies southwestward of the buoy; eastward of this island a good passage leads southward, which is used by vessels bound to Carvers Harbor or to sea. When the eastern end of Farrels Island bears **N.**, Mark Island will open westward of Farrels Island.

Barter Island Ledges lie about ⅝ mile **S.** from Wreck Island, and about ½ mile **W.** by **N.** from the southern end of McGlathery Island; they are about 225 yards in diameter, partly bare at low water, and marked by a red iron spindle with wheel on top.

Harbor Island Ledge is awash at extreme low tides and lies ¼ mile **N.** from the western end of **Harbor Island,** the small prominent bare island north of Merchants Island. The ledge is about 125 yards long in an **E.** and **W.** direction, and is marked off its northern side by a buoy (spar, black, No. 3).

Mid Channel Ledge is small, with a depth of 14 feet over it, lying about 600 yards **NE.** by **N.** from Ewe Island; it is marked by a buoy (spar, red and black horizontal stripes), and can be avoided by giving the buoy a berth of 200 yards.

On the **NNW.** ¾ **W.** course Mark Island will be on the starboard bow and Scraggy Island, low and wooded, will be on the port bow. A **ledge**, showing bare at half tide, makes out 300 yards eastward from Scraggy Island.

On the **WNW.** ¾ **W.** course the entrance to Fox Islands Thorofare will be ahead, and Channel Rock tripod beacon and **Widows Island**, hilly, with large brick building, will be made a little on the starboard bow.

West Mark Island Ledge, a little over ⅛ mile **NW.** by **W.** from Deer Island Thorofare Lighthouse, has 6 feet of water on it, and is marked by a buoy (spar, red, No. 2), which is left on the starboard hand by vessels bound westward, or up East Penobscot Bay.

1 A. ***Entering from Westward.***—Having followed the directions in section 1 A, "Sailing Directions, Fox Islands Thorofare," page 105, when the bell buoy off Channel Rock bears *N.*, distant 150 yards, steer **ESE.** ¾ **E.**, heading so as to pass about ¼ mile southward of Deer Island Thorofare Lighthouse. When the lighthouse in on the port beam, steer **SSE.** ¾ **E.** and pass midway between Farrels and Sparrow islands. When the eastern end of Farrels Island bears *NE.* and is in range with the highest bare hill on Crotch Island, steer **ESE.** ¼ **E.**; leave Mid Channel Ledge buoy on the port hand, Harbor Island Ledge buoy on the starboard hand, and Barter Island Ledges spindle on the port hand. When the southern end of McGlathery Island is in range with the eastern end of Round Island, steer **E.** ½ **S.**, with the north end of Southern Mark Island ahead; pass about 250 yards south of Gooseberry Island, and when the spindle on Colby Ledge bears *N.*, distant 500 yards; then—

Bound through Casco Passage.—Follow the directions in section 1 A, pages 97–98.

Bound to Burnt Coat Harbor.—Steer **E.** ¼ **N.**, pass 300 yards north of Southern Mark Island, leave West Halibut Rock buoy 250 yards on the port hand, and pass 350 yards north of the beacon on Halibut Rocks. When the Halibut Rocks are abaft the beam steer about **E.** by **S.** so as to pass ¼ mile south of Hat Island Ledge buoy (spar, red, No. 2). Then follow the directions for Burnt Coat Harbor, section 1 B, page 86.

Deep-draft Vessels, bound to Sea.—Steer **ENE.** ½ **E.**, passing about ⅜ mile northward of Southern Mark Island and West Halibut Rock buoy (spar, red and black horizontal stripes), and then steer **ESE.** ½ **E.** to a mid-channel position between Halibut Rocks beacon and Hat Island. Then steer **SE.** ¼ **S.**, passing ¼ mile northward of Ringtown Island, and midway between Brimstone and Green islands. Then steer a little more southward to sea.

See remarks and dangers under section 1, preceding. West Halibut Rock is described on page 97. See also dangers under section 1 B, page 86,

FOX ISLANDS THOROFARE.*

This thorofare, leading from East Penobscot Bay to West Penobscot Bay, between North Haven and Vinal Haven islands, is one of the chain of inshore passages commencing at Bass Harbor and ending at Whitehead. It is about 7 miles long, and the channel, with a depth of 18 feet or more, has a least width of about 150 yards in several places; the principal dangers are marked by buoys and spindles, which can be easily followed in the daytime with clear weather. The least depth in the channel is 19 feet, but the thorofare is seldom used by vessels of over 14 feet draft.

Carvers Cove, in the south shore of the thorofare near its eastern end, is an excellent anchorage and convenient for vessels windbound in East Penobscot Bay or passing through the thorofares; it affords shelter from all winds in 14 to 21 feet of water, good holding ground. The anchorage is **SSW.** from Widows Island.

Kents Cove, in the north shore of the thorofare, north of Widows Island, is a good anchorage with 12 to 24 feet of water, good holding ground. **Goose Rocks Lighthouse** (see table, page 18) is the prominent guide for entering this cove either in the daytime or at night.

*Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **311a**, scale $\frac{1}{20,000}$, price $0.20; and in parts on charts **309**, **310**, scale $\frac{1}{40,000}$, price of each $0.25.

Watermans Cove makes into the north shore west of Kents Cove; it is a good anchorage, the water shoaling gradually from 18 feet at the entrance to 5 feet near its head, where a narrow channel leads into a shallow cove called the **Cubby Hole.**

Seal Cove is a large, deep cove making into the south shore west of Zekes Point; the entrance near the western shore has good anchorage in 14 to 36 feet of water.

Perrys Cove is a long, narrow arm making westward on the west shore of Seal Cove; it is of no importance as an anchorage.

Southern Harbor makes northeastward between the Dumpling Islands and Amesbury Point, near the western end of the thorofare. It has good anchorage in 19 to 22 feet water, soft bottom, in the middle of the harbor; the water shoals gradually toward its head.

The village of **North Haven,** on the north shore of the thorofare, west of Seal Cove, has several wharves, but is of no commercial importance; it has steamboat communication with Rockland.

Prominent objects.—Channel Rock tripod beacon, at the eastern entrance, is a prominent mark. Widows Island Hospital is a large brick structure on Widows Island; it will be easily distinguished, as it is the only prominent building at the eastern entrance. **Widows Island** is about 25 feet high, with grassy slopes. **Goose Rocks Lighthouse** is on the north side of the channel, north of Widows Island; it is the guide for the eastern entrance of the thorofare and for the anchorage in Kents Cove. **Browns Head Lighthouse** marks the entrance to the thorofare from westward (see table, page 18). **Fiddler Ledge beacon** (large, gray stone), bearing **W. ¼ S.** from Browns Head Lighthouse, is a prominent mark when approaching from westward.

Tidal currents.—The currents are not strong; they meet at Iron Point, in the middle of the thorofare, the flood setting in from both ends and the ebb setting out. The mean rise and fall of tides is 10 feet (see table, page 27).

SAILING DIRECTIONS, FOX ISLANDS THOROFARE.

The directions must be followed closely to avoid the ledges and rocks on both sides of the channel, a detailed description of which would be confusing.

1. ***Entering from Eastward.***—Having followed the directions in section 1, page 100 or 102, or having stood into the entrance of the thorofare from East Penobscot Bay, when the tripod beacon on Channel Rock bears *N.*, distant about 300 yards, steer **NW. ½ W.**, keeping Goose Rocks Lighthouse a little on the starboard bow. Leave Bradstreet Rock buoy (spar, black, No. 1) about 150 yards on the port hand, and pass about 150 yards south of Goose Rocks Lighthouse, and when it bears *NNE.* change the course to **WNW. ¾ W.** Pass about 100 yards north of Birch Island buoy (spar, black, No. 3) and 100 yards south of Fish Point Ledge buoy (spar, red, No. 4) and steer about **SW.** by **W. ¼ W.** On this course Iron Point Ledge spindle (iron, black) should be kept a little on the port bow; Dobbin Rock buoy (spar, red, No. 8) should be left 25 yards on the starboard hand, and when it is abeam the course should be changed to about **WSW.** so as to leave the spindle about 75 yards on the port hand, and Grindstone Ledge buoy (spar, red, No. 10) about 75 yards on the starboard hand.

When red spar buoy No. 10 bears *N.*, distant about 100 yards, steer **WNW. ½ W.** Lobster Ledge buoy (spar, red, No. 12) will be left about 150 yards on the starboard hand, and when this buoy is abeam steer **NW. ¾ W.**; leave Post Office Ledge buoy (spar, red and black horizontal stripes) about 75 yards on the starboard hand, and follow the southern shore at a distance of 200 yards.

When Calf Point, the western point at entrance to *Youngs Cove*—on the southern shore about ⅝ mile westward of the steamboat wharf at North Haven—is abeam, distant about 225 yards, steer **W. ¼ N.** Pass about 75 yards north of Youngs Point spindle (iron, black, with vanes on top showing like a cylinder), and when it is 150 yards distant abaft the beam, steer about **WSW. ½ W.** Pass 175 yards south of Calderwood Rock buoy (spar, red and black horizontal stripes) and about 175 yards north of Foxes Ears spindle (iron, red, cage on top). When the spindle is in range with Browns Head Lighthouse, bearing about *S.* ¾ *E.*, steer **SW. ¾ W.**, heading so as to pass ¼ mile eastward of the stone beacon on Fiddler

Ledge. Round Fiddler Ledge beacon, leaving it about ¼ mile on the starboard hand, and when it bears *N.*—

Bound to Rockland.—Follow the directions in section 1, "Sailing Directions, Rockland Harbor," page 124.

Bound through Muscle Ridge Channel.—Steer **WSW. ⅞ W.**; pass northward of Fox Island Thorofare bell buoy and continue the course across West Penobscot Bay. Pass 200 yards south of Sheep Island Shoal buoy (spar, red, No. 2) and leave Northwest Ledge and Emery Ledge buoys (spars, red and black horizontal stripes) well on the port hand. When past Emery Ledge buoy, steer more southward; pass 150 yards east of Ash Island beacon (wooden tripod, white and brown) and the black bell buoy, and follow the directions in section 1 A, "Sailing Directions, Muscle Ridge Channel," page 114.

Remarks.—Standing into the entrance of the thorofare, the hospital, a large brick building on Widows Island, will be a conspicuous mark; Channel Rock, marked by a tripod beacon, will show prominently. Goose Rocks Lighthouse may be steered for on any bearing between **NW. ⅜ N.** and **NW. ½ W.**, taking care to leave Bradstreet Rock buoy on the port hand. At night the dangers in the entrance to the thorofare are avoided by keeping in the white rays of Goose Rocks Light. The shores of Widows Island should be given a berth of at least 200 yards. Vessels seeking an anchorage in **Carvers Cove** stand in south of Widows Island and anchor in the middle of the cove; the water shoals gradually toward its head.

After passing Goose Rocks Lighthouse, vessels desiring to anchor in **Kents Cove** should give the light a berth of 200 yards on the starboard hand, and steer about **N.** Anchor according to draft; the water shoals gradually to the northward.

When past Youngs Point spindle, **Sugar Loaves**, a high, dark, rocky ledge, will show prominently southwestward; there is a good channel on both sides of this ledge, but vessels should not pass between Foxes Ears spindle and Sugar Loaves.

Standing on the **SW. ¾ W.** course Fiddler Ledge beacon will be on the starboard bow and Dogfish Ledge spindle on the port bow. At night the white rays of Browns Head Light lead clear of all dangers into West Penobscot Bay.

1 A. ***Entering from Westward.***—Approaching the western entrance to Fox Islands Thorofare, bring Browns Head Lighthouse to bear **ENE. ½ E.** and steer for it on this bearing. When it is about ⅜ mile distant ahead, steer **NE. ½ E.**, passing midway between Browns Head and Sugar Loaves; Calderwood Rock buoy (spar, red and black horizontal stripes) should be left nearly 300 yards on the port hand. From this position steer about **ENE.**; pass about 100 yards north of the spindle off Youngs Point and steer **E. ¼ S.** When Calf Point bears *SSW.*, distant 250 yards, steer **SE. ¾ E.**, and give the southern shore a berth of about 200 yards.

When Lobster Ledge buoy (spar, red, No. 12), which is left on the port hand, is abeam, distant 150 yards, steer **ESE. ½ E.**, and pass about 100 yards south of Grindstone Ledge buoy (spar, red, No. 10). When abreast this buoy, steer **ENE. ¼ E.**, passing about 75 yards westward of Iron Point Ledge spindle, and 50 yards east of Dobbin Rock buoy (spar, red, No. 8). When abreast this buoy steer **NE.** by **E. ¼ E.**, and when up to Fish Point Ledge buoy (spar, red, No. 4), which is left about 100 yards on the port hand, steer **ESE. ¾ E.**, passing 100 yards north of Birch Island buoy (spar, black, No. 1), and 150 yards south of Goose Rocks Lighthouse. When abreast of the lighthouse steer **SE. ½ E.**, leaving Bradstreet Rock buoy (spar, black, No. 1) about 100 yards on the starboard hand and pass south of the bell buoy off Channel Rock. From this buoy—

Bound through Deer Islands Thorofare, or Merchants Row.—Follow the directions under section 1 A, pages 100 or 103.

PENOBSCOT BAY.*

This is the largest and most important of the many indentations on the coast of Maine. It is about 20 miles wide from Isle au Haut on the east to Whitehead on the west, and is nearly 28 miles long from its entrance to the mouth of the Penobscot River. A chain of large and small islands divides it into two parts known as

*Shown in parts on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **309, 310, 311**, scale of each $\frac{1}{40,000}$, price of each $0.25.

East and West Penobscot bays; the southern part of East Penobscot Bay is known as **Isle au Haut Bay.** Numerous harbors indent its shores, those of the most importance being Rockland, Rockport, Camden, and Belfast on the western shore, and Castine on the eastern. The towns and numerous villages on the islands have frequent water communication with some one of the above ports.

The sea approaches to the bay are well marked by the lighthouses on Monhegan Island and Matinicus Rock, and the entrances by Saddleback Ledge Lighthouse on the east and Whitehead and Two Bush Island lighthouses on the west sides of the bay. There are innumerable sunken rocks and ledges in this bay; only those near the tracks of commerce will be noticed. The harbors are well lighted and the more important dangers are indicated by buoys or beacons, making the navigation perfectly easy in clear weather. A large number of coasting and some foreign vessels enter the bay, particularly during the summer months. In winter many of the harbors are obstructed by ice and the Penobscot River is sometimes entirely closed by it. The thorofares are only occasionally obstructed by ice and are much used in the winter by vessels bound along the coast. A stranger can pass through them by closely following the directions in this volume; a sailing vessel requires a fair wind, otherwise it is advisable to take a pilot. (See also pages 13 and 14.)

Pilots for Penobscot Bay can be found eastward at Southwest and Bass harbors. Vessels bound through the inside passages sometimes take a pilot at Calais or Eastport. Vessels from westward if bound into Penobscot Bay take a pilot at Monhegan; if bound through the inside passages, at Whitehead or Seal Harbor. Persons who are reliable pilots can frequently be found on fishing craft and small coasters, but there are no regular licensed pilots for these waters except captains of towboats.

EAST PENOBSCOT BAY*

is the part of Penobscot Bay which lies eastward of Vinal Haven, North Haven, and North and South Islesboro; between Isle au Haut and Vinal Haven Island, its southern end, it is called **Isle au Haut Bay.** The islands in East Penobscot Bay have numerous coves and small harbors, but few of these are available anchorages, some on account of their depth and others on account of the numerous dangers which obstruct their entrances. East Penobscot Bay is entered from eastward through Eggemoggin Reach, Deer Island Thorofare, and Merchants Row, and from southward between Isle au Haut and Vinal Haven Island. **Saddleback Ledge Lighthouse** (see table, page 16) is the guide to this entrance. Numerous unmarked ledges lie westward of the southwestern end of Isle au Haut and off the western entrance to Merchants Row and Deer Island Thorofare. Northeastward of North Haven Island there are numerous islands and ledges.

The channel to the head of Penobscot Bay leads eastward of **Eagle Island,** marked by a lighthouse (see table, page 18), and passes between the islands in a **NNW.** direction to Cape Rosier. A least depth of 9 fathoms can be taken up the bay by closely following the directions.

Head Harbor is a small bight in the south shore of Isle au Haut, just west of Eastern Head; it is exposed to southerly winds and only used by fishermen. The bottom is rocky, except in the northwestern part, where the depth is from 4¾ to 9 fathoms.

Moores Harbor is a cove on the western side of Isle au Haut, about 2½ miles above Western Ear. This harbor has many outlying ledges off the entrance and is an unsafe anchorage.

Isle au Haut Thorofare is on the western side of Isle au Haut, between it and Kimballs Island; though called a thorofare it has a bar near its eastern entrance, dry at low water and extending from Isle au Haut to Kimballs Island. It has a greatest width of ¼ mile at its western end and is well sheltered from all winds with a small anchorage in 5 to 8 fathoms water. A buoy and spindle mark the two principal dangers.

Carvers Harbor is on the south side of Vinal Haven Island (see heading).

Roberts Harbor, about 1¾ miles east of Carvers Harbor on the southeastern side of Vinal Haven Island, is about ⅝ mile in diameter and much obstructed at the entrance by rocks and ledges; it is unsafe for strangers.

Areys Cove is a small cove full of dangers, just northward of Roberts Harbor; it is connected with the latter by a narrow channel with 1 foot at low water.

Winter Harbor, Seal Bay, and **Smiths Cove** make into the northeastern part of Vinal Haven Island, south of the eastern entrance to Fox Islands Thorofare; they are of no commercial importance, and not safe for a stranger to enter.

Fox Islands Thorofare (see heading, page 103).

Carvers Cove and **Kents Cove** are two excellent anchorages and easily entered by strangers, closely following the directions given under heading "Fox Islands Thorofare."

Little Thorofare is a passage into Fox Islands Thorofare north of the main entrance; it is not buoyed, and strangers should not attempt to use it.

Merchants Row, north of Isle au Haut (see heading, page 101).

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*See footnote, page 105.

Deer Island Thorofare, south of Deer Isle (see heading, page 99).

Burnt Cove and **Crocketts Cove** are two small coves lying between Fifields Point and Barred Island, on the southwestern side of Deer Isle; they are of no importance as anchorages.

Southwest Harbor is on the western side of Deer Isle, about 4 miles north of Deer Island Thorofare Lighthouse; it is about ¼ mile wide at the entrance and 1 mile long, with anchorage in 3 to 5 fathoms water, but is not much used as it is open southward. The village of **Sunset** is on the eastern shore of the harbor.

Northwest Harbor, on the northwestern side of Deer Isle, is about ⅜ mile wide and 1¼ miles long in a **SE.** and **NW.** direction. A large part of its upper end is bare at low water, but below and abreast the steamboat wharf good anchorage will be found for small craft in 13 to 17 feet water, soft bottom; the harbor is exposed to northwesterly winds, and is not used by vessels seeking shelter. The village of **Deer Isle,** near the head of the harbor, has steamboat communication with Rockland. Vessels of 7 feet draft have been taken up to the village, but they lie aground at low water; there is 7 feet at low water at the end of the steamboat wharf. Pilots for the harbor can be found at Stonington, in Deer Island Thorofare. During January and February it is closed by ice. For sailing directions see Sailing Directions for east Penobscot Bay, section 2, paragraph VI.

Eggemoggin Reach enters the bay from eastward north of Little Deer Isle (see heading, page 92).

Islesboro Harbor is an open bight in the northeastern side of South Islesboro, about **W.** by **N.** from the southwestern point of Cape Rosier; it affords good shelter in westerly winds, and has a depth of 7 fathoms. Off the southern point, at the entrance, is a ledge which is bare at half tide, and marked by two buoys. Strangers should pass northward of these and anchor, giving the western shore a berth of 600 yards.

Sabbath Day Harbor is a small cove in the southeastern side of North Islesboro, and a little over 2 miles northward of **Hewes Point,** the high point on south side of entrance to Islesboro Harbor. It is open southward and affords anchorage for small vessels in 6 to 18 feet of water. There are several summer houses on its shores.

Castine Harbor, Bagaduce River, and **Smiths Cove,** making into the eastern shore, about 3¾ miles north of Cape Rosier, are fully described under heading "Bagaduce River and Castine Harbor."

Parkers Cove on the east side of North Islesboro and **WSW.** from Dice Head Lighthouse, is a small, shallow cove, only used as an anchorage by small vessels well acquainted with the locality.

For Stockton Harbor, see West Penobscot Bay.

SAILING DIRECTIONS, EAST PENOBSCOT BAY.

These directions are good for vessels of the deepest draft, and lead in the best water to the entrance of Penobscot River.

1. *Approaching and Entering, from Eastward.*—Passing ½ mile north of Mount Desert Rock, steer **WNW.** ⅝ **W.** about 21 miles, and pass 1¾ miles south of Isle au Haut to the whistling buoy off Roaring Bull. Or, with Long Island Head bearing *N.*, distant about 1 mile, steer **W.** ⅞ **S.** about 14¼ miles and pass about 1¾ miles south of Isle au Haut to the whistling buoy off Roaring Bull.

When near the whistling buoy and Saddleback Ledge Lighthouse bears **NW.** ¼ **W.**, steer for the lighthouse, and as it is approached haul more northward so as to bring it to bear *W.*, distant about ⅜ mile. Then follow the directions in section 2.

Or, bring Saddleback Ledge Lighthouse to bear between **NW.** ½ **W.** and **N.** and steer for it; pass about ⅜ mile eastward of the lighthouse and follow the directions in section 2.

Remarks.—Approaching the southern entrance to East Penobscot Bay, **Isle au Haut,** large, high, and well wooded island on the east side of the entrance, will be easily recognized. **Eastern Ear** is the small islet eastward of the southeastern point of Isle au Haut, and **Western Ear** the small islet off its southwestern point. Roaring Bull Ledge spindle is hard to distinguish when approaching from southward, but the ledge is usually marked by breakers; the whistling buoy is ¾ mile **S.** of the spindle. Isle au Haut should be given a berth of 1¾ miles until Saddleback Ledge Lighthouse comes on the bearing. When south of Isle au Haut, Saddleback Ledge Lighthouse will be seen northwestward in the middle of the entrance to the bay, which is here also known as Isle au Haut Bay. Numerous small islands will be seen westward of the lighthouse and south of Vinal Haven Island. **Seal Island,** the easternmost of the outside islands off Penobscot Bay, will be seen southwestward in the distance on a clear day.

Saddleback Ledge is a small, dark, rocky islet in the middle of the entrance to East Penobscot Bay, about 3 miles **NW.** by **W.** ¼ **W.** from Western Ear. It is marked by **Saddleback Ledge Lighthouse** (see table, page 16), which should be given a berth of at least 350 yards when passing.

Dangers.—Approaching East Penobscot Bay from eastward, the small islands eastward of Isle au Haut should not be approached closer than 1¼ miles while southward of them.

Eastern Ear Ledge, bare at low water, lies about ¼ mile **S.** by **E.** ½ **E.** from the eastern end of Eastern Ear; it is marked by a buoy (nun, red, No. 2); the sea usually breaks on it.

Cape Ann Ledge has two spots with 4 and 9 feet over them, and lies about ⅝ mile **S.** by **W.** from the southern point of Eastern Head. The ledge is not marked; the sailing line passes nearly 1½ miles southward of it.

Roaring Bull Ledge, bare at half tide and marked by a spindle (iron, red) lies about 1¼ miles **SW.** ½ **W.** from Eastern Head, and about 1⅛ miles **SE.** from Western Ear. There is good water around this ledge, but strangers are advised to keep well southward of it, passing close to the whistling buoy.

Western Ear Ledge, bare at half tide, lies nearly ¼ mile southward of Western Ear. The sailing lines pass ½ mile or more southward of this ledge.

The Washers, Black Ledges, Big Brewster, and **Keelers Rock** are an irregular cluster of rocks and islets extending ⅝ mile westward from Western Head; some of them are bare at all times and others at low water.

The Brandies are three small, bare rocks, the westernmost of the ledges making westward from Isle au Haut. This ledge lies 2 miles **E.** ¼ **N.** from Saddleback Ledge Lighthouse, and about 1⅛ miles off the western shore of Isle au Haut; vessels should not pass eastward of it.

1 A. ***Approaching and Entering, from Southwestward.***—Passing about 1 mile south of Matinicus Rock, and 1 mile north of the whistling buoy, when the lighthouses bear *N.* steer **NE.** by **E.** about 9 miles; Saddleback Ledge Lighthouse will then bear *N.* by *E.* ⅛ *E.*, and the eastern end of Seal Island will bear *NNW.* ½ *W.*, distant 1 mile. From this position a **N.** by **E.** ½ **E.** course will lead about ⅝ mile eastward of Seal Island, and about ⅜ mile eastward of Saddleback Ledge Lighthouse; when this lighthouse bears *W.*, about ⅜ mile distant, follow the directions in section 2.

Note.—Vessels coming from westward, and bound to Castine or Eggemoggin Reach, will find it to their advantage to use the directions for West Penobscot Bay.

Remarks and dangers.—The **NE.** by **E.** course leads south of Wooden Ball and Seal islands, and the ledges between them. **Seal Island,** the easternmost, is even in outline and presents no marked features; it is left over ¾ mile on the port hand.

The **N.** by **E.** ½ **E.** course passes midway between the eastern end of Seal Island and Three Fathom Ledge. Saddleback Ledge Lighthouse will be a little on the port bow.

Eastern Ledge makes out about ¼ mile from the eastern end of Seal Island, and **Three Fathom Ledge,** which is small, lies 1⅜ miles **ENE.** ¾ **E.** from the eastern end of Seal Island; these are the only dangers that require attention, and they can be avoided by passing from ½ to 1 mile eastward of the eastern end of the island, or by giving it a berth of 1¾ miles and passing eastward of Three Fathom Ledge.

1 B. ***Approaching and Entering, from Westward.***—Pass about 1 mile south of Monhegan Island and steer **E.** ¾ **N.**; this course made good about 17 miles leads to within 2 miles of the northern end of Matinicus Island and about ½ mile south of Foster Ledges. When Foster Ledges buoy bears ½ mile distant on the port beam, steer **NE.** by **E.** ½ **E.**; this course made good 13 miles leads ⅜ mile south of Saddleback Ledge Lighthouse. Round the lighthouse at this distance, and when it bears *W.* follow the directions in section 2.

****Note.***—From a position 1 mile southward of Monhegan Island an **ENE.** ½ **E.** course made good for 16½ miles will lead to the black whistling buoy between the Pigeon Ground and Green Island Seal Ledges. From this buoy the course continued for 13½ miles will lead ⅜ mile south of Saddleback Ledge Lighthouse. Care must be taken not to be set northward on this course, as it leads about ¾ mile southward of Haddock Ledge, which is not marked.

Remarks.—The **E.** ¾ **N.** course leads about 4 miles south of Metinic Green Island and Large Green Island. The northern end of Matinicus Island should be made ahead and kept on the bearing **E.** ¾ **N.** **At night** Marshalls Point, Whitehead, and Two Bush Island lights will be sighted off the port beam and Matinicus Rock Light off the starboard bow. Foster Ledges buoy should be made on the port bow and left ½ mile on the port beam.

Standing on the **NE.** by **E.** ½ **E.** course from this buoy, the northern end of Matinicus Island and the small islands eastward should be left about ⅞ mile on the starboard hand. The highest point of Isle au Haut will be

* These directions are good for strangers from May to October, during which time only Green Island Seal Ledges whistling buoy is maintained in position.

a little on the starboard bow, and Saddleback Ledge Lighthouse will be made a little on the port bow. The sailing line passes well southward of the islands and ledges lying south of Vinal Haven Island.

Dangers.—**Gull Rock Ledge** has 3¾ fathoms over it, and lies 1 mile **SSE.** ⅝ **E.** from Monhegan Lighthouse, and ⅜ mile from the shore of the island. To avoid this ledge give the southern end of the island a berth of over 1 mile.

Haddock Ledge is small, with 13 feet of water over it, and lies 7½ miles **E.** by **N.** from Monhegan Lighthouse, and 2½ miles **SW.** from Metinic Green Island; it is not marked. The **E.** ¾ **N.** course passes 2 miles south of it.

Pigeon Ground is an irregular shoal with depths on it varying from 3½ to 7 fathoms; it extends about 2 miles **ENE.** and **WSW.**, and is 2 miles southward of Large Green Island. There is deep water between the two shoalest parts of this shoal. The **E.** ¾ **N.** course passes about 1¼ miles south of it.

Green Island Seal Ledges, showing bare about half tide and marked by breakers, lies ⅞ mile **SSE.** from Large Green Island. About ⅝ mile **SE.** from this ledge is a black whistling buoy which marks the channel between the ledges and Pigeon Ground; vessels pass southward of the buoy.

Foster Ledges are about 500 yards in diameter, have 6 feet to 6 fathoms of water over them, and are marked by a buoy (spar, red and black horizontal stripes) placed south of the shoalest part. These ledges lie 2⅛ miles **W.** ¼ **N.** from the northern point of Matinicus Island, and 2 miles **NW.** ½ **N.** from **South Point**, the southwestern point of the island.

Bantam Ledge is a small ledge bare at half tide, lying 2¼ miles **WSW.** ⅓ **W.** from South Point on Matinicus Island, and 2¼ miles **SSW.** ¼ **W.** from Foster Ledges. It is marked by a buoy (spar, red and black horizontal stripes) placed 100 yards south of the ledge. There is good water on all sides.

Zephyr Rock and **Zephyr Ledges** are a number of shoal spots, some showing bare at low water, which extend nearly ¾ mile in a **NE.** direction from **No Mans Land**—the easternmost of the islands off the northern end of Matinicus Island.

Bay Ledge is small, showing bare at low water, and lies 3½ miles **S.** by **W.** ⅝ **W.** from Heron Neck Lighthouse and 6½ miles **W.** ⅞ **S.** from Saddleback Ledge Lighthouse; it is marked by a buoy (nun, red, No. 2) off the southwestern side of the dry part of the ledge, and can be avoided by giving the buoy a berth of ½ mile.

Snippershan is a shoal with a least depth of 6 fathoms, on which the sea sometimes breaks; it lies 4¼ miles **SW.** ⅓ **S.** from Saddleback Ledge Lighthouse and 3⅜ miles **N.** ⅝ **W.** from the eastern end of Seal Island. There is from 25 to 50 fathoms of water all around this ledge.

2. ***From Saddleback Ledge Lighthouse to Cape Rosier.***—*1.* When Saddleback Ledge Lighthouse bears *W.*, distant about ⅜ mile, steer **N. ¾ E. Northerly**; this course made good for 12¼ miles will lead ¼ mile east of Eagle Island Lighthouse. When the lighthouse bears *W.*, distant about ¼ mile, steer **NNW.** a little over 5¼ miles and take care to give the islands on the port hand a berth of at least ¼ mile. When Green Ledge, small, low, grassy island, bears *E.*, distant about ½ mile, steer **N.** by **E.** ½ **E.**, so as to pass ½ mile west of Cape Rosier, and follow the directions in section 3.

Remarks.—The **N. ¾ E. Northerly** course leads up the middle of the bay; Eagle Island will be made a little on the port bow. On the starboard hand the islands and ledges off the entrances to Merchants Row and Deer Island Thorofare will be seen, and Deer Island Thorofare Lighthouse will be easily distinguished; when this lighthouse bears about **ENE.**, The Brown Cow should be in range with it and be ⅝ mile distant from the vessel. On the port hand, opposite the lighthouse, the entrance to Fox Islands Thorofare and Goose Rocks Lighthouse will be seen; the hospital (large, brick building) on Widows Island will be a conspicuous mark. The western tangent of **Bradbury Island**, a high, bold island, thickly wooded, will be ahead. When within 1 mile of the eastern end of Eagle Island care should be taken to keep eastward of the red and black horizontally striped spar buoy, marking Porcupine Ledge.

On the **NNW.** course, **Hardhead Island**—small, bare island about **ENE.** from Eagle Island Lighthouse—is left well on the starboard hand. The sailing line passes westward of Middle Rock and Bradbury Island. **Cape Rosier**, a high, dark headland, will be broad on the starboard bow, and a group of bare islands will be seen southward of it. The group of high, partly wooded islands lying northwestward of Eagle Island will be left on the port hand and should not be approached closer than ¼ mile. **Green Ledge**—a low, rocky islet, covered with grass, the westernmost of the group of islands south of Cape Rosier—will be made on the starboard bow and passed ½ mile distant.

Standing up the bay on the **N.** by **E.** ½ **E.** course, see the remarks under section 3.

Dangers.—**Brimstone Island** is the largest of a group of small islands lying about 1¾ miles westward of Saddleback Ledge Lighthouse. Many rocks and ledges, some showing bare at half tide, surround these islands. They are avoided by giving Brimstone Island a berth of ¾ mile while southward of it and ½ mile while eastward.

Diamond Rock Ledge, with 2 feet of water over it, lies nearly ¾ mile **NNE.** from Brimstone Island and is marked by a buoy (spar, black, No. 1) on its northern side.

Saddleback Ledge Shoal is a rock with 4 feet over it, lying nearly ⅞ mile **NNW.** ¼ **W.** from Saddleback Ledge Lighthouse. It is marked by a buoy (spar, red and black horizontal stripes) placed off the southwestern side of the rock and can be avoided by giving the buoy a berth of at least 250 yards.

Triangle Ledge and **Little Triangle Ledge**, one bare at half tide, the other with 3 feet of water over it, lie about ¾ mile from the eastern shore of Vinal Haven Island and about 3 miles **N.** by **W.** ⅝ **W.** from Saddleback Ledge Lighthouse. The ledges are about 350 yards apart in a **N.** and **S.** direction and marked by two buoys (spars, black, Nos. 5 and 7).

Outer Scrag Ledge is a large ledge, which shows bare except at high water, lying on the eastern side of the channel about 1½ miles **SW.** by **S.** from Deer Island Thorofare Lighthouse and ⅞ mile **WSW.** ¾ **W.** from Sparrow Island. There is an 18-foot spot nearly ⅝ mile **SW.** from this ledge.

The Brown Cow is a small, bare ledge with shoal water extending about 200 yards northward and southward from it; at high water the rock is not easily distinguished. It lies ¾ mile **W.** ¼ **S.** from the western end of Scraggy Island and 1¼ miles **WSW.** ¼ **W.** from Deer Island Thorofare Lighthouse.

West Mark Island Ledge is a detached ledge lying a little over ⅝ mile **NW.** by **W.** from Deer Island Thorofare Lighthouse; it has 6 feet of water over it and is marked by a buoy (spar, red, No. 2).

Babbidge Island Ledges extend out about 700 yards from the southeastern side of Babbidge Island, the island at the northern side of entrance to Fox Islands Thorofare.

Sellers Rock is a small, bare rock lying ⅝ mile from the western shore of Stinson Point, about 2⅝ miles above Deer Island Thorofare Lighthouse. There is a small ledge with 6 feet of water over it about 250 yards southward of the rock. A red and black horizontally striped spar buoy is placed westward of these rocks.

Porcupine Ledge, a small spot with 16 feet over it, lies nearly ¾ miles **S.** ¼ **W.** from Eagle Island Lighthouse; it is marked by a buoy (spar, red and black horizontal stripes).

Middle Rock is a small rock with 10 feet over it, and deep water all around; it is marked by a buoy (spar, red and black horizontal stripes), and lies nearly ¾ mile **NE.** by **N.** from Eagle Island Lighthouse.

There are no dangers above Middle Rock that can not be seen so as to be avoided. The islands westward of the sailing line should not be approached from eastward nearer than 350 yards.

II. Bound Eastward through Merchants Row.—Bring Saddleback Ledge Lighthouse to bear *SW.* ⅜ *S.*, and steer **NE.** ⅜ **N.**, keeping it on that bearing, with Hardwood Island directly ahead. Pass a little over ¼ mile westward of Kimballs Rock, and leave Ram Island Sunken Ledge buoy (spar, red and black horizontal stripes) 300 yards on the starboard hand. Then steer about **ENE.** ½ **E.**, and when Ewe Island is open eastward of Hardwood Island, and shows under the highest point of Crotch Island, steer **NNE.** ¼ **E.** Pass midway between Merchants and Hardwood islands, and about 300 yards eastward of Ewe Island. When Mid-Channel Rock buoy (spar, red and black horizontal stripes) bears on the port bow, distant about 350 yards, steer **ESE.** ¼ **E.** and follow the directions in section 1 A, page 103.

Remarks and dangers.—On the **NE.** ¼ **N.** course **Hardwood Island**, small, thickly wooded, with smooth rounded top and rocky water line, will be ahead, and **Merchants Island** (large) will be seen just eastward of it a little on the starboard bow. When Kimballs Head bears about **E.**, Kimballs Rock will be in range with the head. When standing through the passage between Merchants and Hardwood islands, a small 16-foot spot lying about 300 yards **S.** from the southern end of Hardwood Island should be avoided.

Kimballs Rock is a small, bare rock lying nearly ⅜ mile **W.** from **Kimballs Head**, the western point of Kimballs Island; it is about 2 miles eastward of the sailing line when bound up the bay, and about ¼ mile when bound into Merchants Row.

Ram Island Sunken Ledge is a small ledge with 6 feet over it lying a little over ⅝ mile **S.** ¼ **W.** from **Ram Island**, the small island ¼ mile **SW.** from Hardwood Island. The ledge is marked by a buoy (spar, red and black horizontal stripes), which should be given a berth of 300 yards.

III. Bound to Fox Islands Thorofare.—Following the directions in paragraph I preceding, when on the **N.** ¾ **E.** course about 3¼ miles above Saddleback Ledge Lighthouse and Kimballs Head is on the starboard beam, steer **NNW.** ¼ **W.** Give the shore of Vinal Haven Island a berth of about ½ mile, and when Goose Rocks Lighthouse bears **NW.**, steer for it, and follow the directions in section 1, page 104.

Note.—Vessels entering Fox Islands Thorofare at night should anchor in Kents Cove. Keeping in the white rays of Goose Rocks Light will lead clear of the dangers in the entrance to the thorofare.

Remarks.—On the **NNW.** ¼ **W.** course, the large red tripod beacon on Channel Rock will be ahead. Goose Rocks Lighthouse will be on the port bow, and the large brick hospital building on Widows Island will show just left of the lighthouse.

IV. Bound to Deer Island Thorofare.—Following the directions in paragraph I preceding, when on the **N.** $\frac{3}{4}$ **E.** course Deer Island Thorofare Lighthouse bears **E.** $\frac{1}{2}$ **N.**, steer for it. Pass about 250 yards north of the lighthouse and follow the directions in section 1 A, page 100.

Remarks.—The **E.** $\frac{1}{2}$ **N.** course leads a little over $\frac{1}{4}$ mile northward of The Brown Cow and Scraggy Island, and $\frac{5}{8}$ mile southward of West Mark Island Ledge buoy (spar, red, No. 2).

*V. Bound into West Penobscot Bay, by the passage north of North Haven Island.**—Following the directions in paragraph I preceding, on the **N.** $\frac{3}{4}$ **E.** course, when the highest part of *Babbidge Island*—the island on north side of entrance to Fox Islands Thorofare—bears *W.* by *S.*, steer **N.** by **W.** $\frac{1}{4}$ **W.** for the southwestern end of Eagle Island. Leave *Bald Island*—small, high, rocky island—about $\frac{1}{4}$ mile on the port hand, and when the southwestern end of Eagle Island is distant $\frac{1}{4}$ mile, steer **NW.** by **W.** $\frac{3}{4}$ **W.** On this course *Grass Ledge*—low, rocky islet surrounded by ledges—should be left nearly $\frac{1}{4}$ mile on the port hand, and *Oak Island*—lying 1 mile *WNW.* $\frac{1}{2}$ *W.* from Grass Ledge—should be left $\frac{1}{4}$ mile on the port hand. When the northwestern point of Oak Island bears *SW.* $\frac{1}{2}$ *S.*, steer **WSW.** $\frac{7}{8}$ **W.**, passing about midway between the northwestern point of Oak Island and Spoon Island. Leave *Websters Head*—northernmost point of North Haven Island, 120 feet high—about $\frac{5}{8}$ mile on the port hand, and continue the course, which will lead across West Penobscot Bay and into Rockland Harbor.

Remarks and dangers.—All dangers are avoided if the islands and north shore of North Haven Island are given a berth of 350 yards or more. **Fling Island,** lying a little over $\frac{1}{2}$ mile westward of Eagle Island, has ledges extending nearly 700 yards in a **SW.** direction from its southern end; the **NW.** by **W.** $\frac{3}{4}$ **W.** course leads well southward of these ledges.

VI. Bound to Northwest Harbor.—Following the directions in paragraph I preceding, when on the **N.** $\frac{3}{4}$ **E.** course and Eagle Island Lighthouse is about $1\frac{1}{8}$ mile distant, the southern Porcupine will be on the port beam, distant a little more than $\frac{1}{2}$ mile. From this position steer **NE.**, passing about $\frac{1}{2}$ mile eastward of Hardhead Island and $\frac{5}{8}$ mile northward of Dunham Point; bring Hardhead Island to bear *WSW.* $\frac{1}{2}$ *W.* astern, and steer **ENE.** $\frac{1}{2}$ **E.** Leave Gull Ledge buoy (spar, red, No. 4) 300 yards on the starboard hand; continue the course a little over $\frac{1}{2}$ mile past the buoy, and then steer **SE.** into the middle of the harbor. Anchor off the steamboat wharf in 14 feet of water, soft bottom.

Remarks and dangers.—On the **NE.** course care must be taken to avoid Dunham Point Ledge, which extends 400 yards in a northwest direction from the point and is bare at half tide. **Hardhead Island** is the small bare islet lying nearly $\frac{3}{4}$ mile **ENE.** $\frac{1}{2}$ **E.** from Eagle Island Lighthouse.

On the **ENE.** $\frac{1}{2}$ **E.** course Gull Ledge, parts of which show bare at all stages of the tide, should be left 350 yards or more on the starboard hand. When entering Northwest Harbor give the eastern shore a berth of 200 yards.

3. *From Cape Rosier to Fort Point.*—Pass $\frac{1}{2}$ mile westward of Cape Rosier, steering **N.** by **E.** $\frac{1}{2}$ **E.** and continue up the bay. When Fort Point Lighthouse bears **NE.** $\frac{5}{8}$ **N.** steer for it on that bearing. Pass at least 200 yards westward of Fort Point Ledge beacon and midway between the beacon and lighthouse, hauling eastward so as to give the point a berth of $\frac{1}{4}$ mile when it bears *W.*; then follow the directions under heading "Penobscot River," page 122.

Or, if in a sailing vessel and waiting for a favorable tide or towboat to go up the river, anchor on the western side of the channel above Fort Point, about on a line between Fort Point and Sandy Point.

If the tide and wind are favorable, sailing vessels may follow the directions under heading "Penobscot River" as far as Bucksport, above which strangers should take a pilot or towboat.

*This passage is generally used in the winter when Fox Islands Thorofare is closed by ice, but a stranger should not attempt it except in the daytime with clear weather.

Remarks.—On the **N.** by **E.** ½ **E.** course Dice Head Lighthouse and the entrance to Castine Harbor will be made and passed, leaving them on the starboard hand. Islesboro Harbor, Sabbath Day Harbor, and Parkers Cove will be left on the port hand. The sailing line leads about midway between Dice Head and **Coombs Point,** the eastern point of North Islesboro; Cape Jellison will be ahead, Fort Point Lighthouse on the starboard bow, and **Sears Island**—high, wooded, with a clear space on its southern slope—will be on the port bow.

On the **NE.** ⅝ **N.** course, with Fort Point Lighthouse ahead, Fort Point Ledge beacon will be made a little on the starboard bow and the high hills on Whitmores Island will be seen back of and a little to the left of the lighthouse.

Dangers.—**Hewes Ledge** is a large ledge, bare at half tide near its northern end and awash at low water near the southern; it lies ¼ mile **NNE.** from **Hewes Point**—the northeastern point of South Islesboro. The northeast end of the ledge is marked by a buoy (spar, black, No. 1), and the southwest end by another buoy (spar, red, No. 2).

Long Island Ledge has 8½ feet over it, and lies ¾ mile from the eastern shore of North Islesboro, off Parkers Cove. It is marked by a buoy (spar, black, No. 9) placed off its eastern end; the ledge bears **S.** ⅝ **W.** nearly 1 mile from Coombs Point, and **SW.** by **W.,** about 2½ miles, from Dice Head Lighthouse.

Steels Ledge, showing bare at low water, makes off nearly ½ mile from the eastern shore in the bight, about 2 miles below Fort Point. The end of this ledge is marked by a buoy (spar, red, No. 2) which bears about **E.** ⅝ **S.** from the southern point of Sears Island and **S.** by **W.** ½ **W.** from Fort Point Lighthouse.

Fort Point Ledge is a large ledge, bare near its northern end at half tide, lying ⅜ to ⅝ mile **S.** of Fort Point Lighthouse. On the highest part of the ledge is a square gray stone beacon, with a mast and keg on top; about ¼ mile **SSE.** ½ **E.** from the beacon the ledge has 6 feet over it. The beacon should be given a berth of ⅝ mile when approaching from southward and eastward.

MUSCLE RIDGE CHANNEL.*

This passage leads into West Penobscot Bay from westward and is much used by vessels on account of its being sheltered from all winds and affording an anchorage in case of bad weather. From its entrance at Whitehead it extends in a **NE.** direction about 6 miles to Sheep Island, and the channel passes between numerous rocks and ledges. These dangers are, however, so well marked that in clear weather with a fair wind no difficulty will be experienced by sailing vessels in following the directions. On the eastern side of the channel is a large group of islands and ledges which separates it from Penobscot Bay. These islands are of no importance except for their granite quarries; **Dix Island** is distinguished by the large buildings on it. **Two Bush Island,** the southernmost of these islands, is marked by **Two Bush Island Lighthouse** (see table, page 18), a guide for Two Bush Channel and West Penobscot Bay. Southward of these islands **Two Bush Channel** leads into West Penobscot Bay.

Seal Harbor is an anchorage much used by coasters on the western side of Muscle Ridge Channel between Whitehead and Sprucehead islands; it has 18 to 23 feet of water with soft bottom. The post village of **Sprucehead** and a large granite quarry are on the north side of Seal Harbor. For directions entering see page 114.

Dix Island Harbor is an anchorage between Andrews, Birch, and Dix Islands; it is reached from southwestward through a narrow and crooked channel leading between the ledges north of Hewells Island; it is unsafe for strangers to enter.

Westkeag River empties into the western side of Muscle Ridge Channel in the head of the bight westward of Ash Island and about midway between Whitehead and Owls Head. This river has a narrow and crooked channel, unsafe for strangers. The village of **South Thomaston** is at the head of navigation, 2 miles above its mouth; the greatest draft taken to the village is 10 feet, the usual draft about 8 feet; 4 feet can be taken into the entrance at low water. Strangers generally take a pilot, anchoring off the mouth of the river with signal set until boarded by one. South Thomaston is about 3 miles overland from the city of Rockland and the same distance from Thomaston.

Fisherman Island Passage leads from Muscle Ridge Channel to Penobscot Bay, between Fisherman Island and Sheep Island. Several dangers lie in this passage, but they are marked by buoys and can be easily avoided in the daytime in clear weather.

Owls Head Bay lies between Sheep and Monroe islands on the east and the mainland on the west, and is a continuation of Muscle Ridge Channel northward of Fisherman Island Passage. The channel through Owls Head Bay is very narrow on the western side of Sheep Island where it is marked by two buoys.

Owls Head Harbor is a small, shallow cove in the west shore of Owls Head Bay, about ½ mile south of Owls Head Lighthouse. This cove affords anchorage for small vessels that lie aground at low water.

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*Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **312**, scale $\frac{1}{40,000}$, price $0.25.

Prominent objects.—Whitehead Island is marked by **Whitehead Lighthouse** (see table, page 18) on its eastern end, and on its southwestern side by a life-saving station; the latter and several flag-staffs are conspicuous when approaching from southwestward. Standing up through the channel from southward the large tripod beacon off the eastern side of **Ash Island** will show conspicuously on the port bow, and the tripod beacon on **Otter Island** on the starboard bow. On the eastern side of the channel Dix Island with its numerous houses will be most readily distinguished. **Owls Head Lighthouse** (see table, page 18) will be plainly seen when abreast of Ash Island, and the large buoys off Sheep Island bar are conspicuous when passing into Owls Head Bay.

Storm warning displays of the United States Weather Bureau are made at Whitehead Lighthouse.

For **tides** see table, page 27.

SAILING DIRECTIONS, MUSCLE RIDGE CHANNEL.

These directions can be readily followed by sailing vessels in the daytime in clear weather with a fair wind; they carry a least depth of about 5 fathoms. Strangers should not attempt this passage in the night. It has been noticed that the fog signal at Whitehead is subject to aberration of sound in thick weather. The rocks and ledges are too numerous for a description of them to be of use for the navigator.

1. ***From Southwestward, Whitehead to Owls Head.***—Follow the directions in section 1 A, page 117, and when Whitehead Lighthouse is made and is less than 4 miles distant steer for it on any bearing between **NE.** by **N.** and **NE.** by **E.** ¼ **E.** Pass north of the red bell buoy and red spar buoy No. 2, and about 300 yards east of the lighthouse.

When Whitehead Lighthouse bears about *WNW.*, distant 300 yards, steer **NE.** ½ **E.**, heading about midway between the tripod beacons on Otter Island and Ash Island. Leave a red spindle about 350 yards on the starboard hand and a black can buoy (No. 1) about 200 yards on the port hand. A red and black horizontally striped can buoy will be ahead; this buoy should be left 100 yards on the starboard hand and the **NE.** ½ **E.** course be continued, leaving red spar buoy (No. 4) about 300 yards on the starboard hand and black spar buoy (No. 5) 300 yards, and a black spindle 550 yards on the port hand. After passing the latter, red spar buoy (No. 6) should be left about 250 yards on the starboard hand, and ½ mile farther the course leads midway between the tripod beacon on Otter Island and a black spindle. About ½ mile above the spindle black spar buoy (No. 7) will be left on the port hand, a red and black horizontally striped nun buoy should be left about 150 yards on the starboard hand, and black spar buoy (No. 9) off the south end of Ash Island should be left well on the port hand. The black bell buoy, abreast the white and brown tripod beacon on the eastern end of Ash Island, should be left 200 yards on the port hand.

When the bell buoy off Ash Island bears abeam, distant about 200 yards, steer **NNE.** ¼ **E.**, heading between a red nun buoy and black can buoy, which are 1¾ miles distant ahead. Leave the red nun buoy (No. 2) about 100 yards on the starboard hand and steer **NE.** On this course the western shore of Munroe Island will be given a berth of 175 yards, and a black spindle, and farther on a black can buoy (No. 3), will be left about 200 yards on the port hand. When Owls Head Lighthouse bears *WNW.*, distant ¼ mile—

Bound to Rockland.—Follow the directions under that heading, page 124.

Bound up West Penobscot Bay.—Steer **NNE.** ½ **E.** about 7 miles until Negro Island Lighthouse bears *W.* by *N.*, then follow the directions in section 2, page 117.

Bound to East Penobscot Bay or through Eggemoggin Reach.—Steer **NE.** by **E.** ½ **E.** for 5½ miles. Pass about ¾ mile southeastward of McIntosh Ledge buoy (nun, red and black horizontal stripes), and when this buoy is in range with Robinson Rock steer **NE.** ¼ **N.** When about ½ mile from the shore above Cape Rosier, follow the directions in section 3, "Sailing Directions, East Penobscot Bay," page 111.

To pass into Penobscot Bay through Fisherman Island Passage.—When on the **NE.** ½ **E.** course standing up Muscle Ridge Channel, the bell buoy off Ash Island bears *WNW.*, and is

distant about 200 yards, steer **NE.** for ¾ mile, heading for the eastern end of Munroe Island. Then steer **ENE.** ⅞ **E.**, and leave Emery Ledge buoy and Northwest Ledge buoy (spars, red and black horizontal stripes) about 200 yards on the starboard hand, and Sheep Island Shoals buoy (spar, red, No. 2) about 350 yards on the port hand. Continue the course until Owls Head Lighthouse shows clear of the north end of Munroe Island; then steer **N.** by **E.** ½ **E.** up the bay.

Or, if bound to Fox Islands Thorofare, continue the **ENE.** ⅞ **E.** course until ¼ mile south of Fiddler Ledge beacon. Then follow the directions in section 1 A, page 105.

1 A. ***From Northeastward, Owls Head to Whitehead.***—With Owls Head Lighthouse bearing *WNW.*, distant ¼ mile, steer **SW.** Sheep Island Bar buoy (nun, red, No. 2) will be a little on the port bow and left 100 yards on the port hand. From this buoy steer **SSW.** ¼ **W.**; Ash Island beacon and bell buoy will be on the starboard bow and the bell buoy will be left 200 yards on the starboard hand.

When Ash Island beacon bears *W.*, steer about **SW.** ½ **W.** Leave two black spar buoys (Nos. 9 and 7) on the starboard hand and a red and black horizontally striped nun buoy 150 yards on the port hand.

Pass midway between Otter Island tripod beacon and the spindle northwestward of it. After passing the beacon leave red spar buoy No. 6 about 250 yards on the port hand and a spindle 550 yards on the starboard hand. The next aid passed is black spar buoy No. 5, which is left 300 yards on the starboard hand. Red spar buoy No. 4 should be left 300 yards on the port hand and a red and black horizontally striped can buoy about 100 yards on the port hand. A black can buoy (No. 1) should be left 200 yards on the starboard hand and the spindle on Yellow Ledge (red, iron shaft, cylinder on top) about 350 yards on the port hand.

Pass 300 yards eastward of Whitehead Lighthouse and steer about **SW.** by **W.**, leaving red spar buoy No. 2 and the red bell buoy about 300 yards on the port hand.

GENERAL DIRECTIONS, SEAL HARBOR.

Follow the directions for Muscle Ridge Channel, and when about ¾ mile northeastward of Whitehead Lighthouse and near Lower Gangway Ledge buoy (can, red and black horizontal stripes), steer westward so as to pass about midway between two black spar buoys lying southward of Burnt Island. When midway between these buoys steer **NW.** ½ **N.** and anchor in 3 to 4 fathoms just westward of red spar buoy No. 2, which lies south of the western end of Sprucehead Island.

WEST PENOBSCOT BAY.*

This is the part of Penobscot Bay lying west of Vinal Haven, North Haven, and North and South Islesboro islands. Heron Neck Lighthouse marks the eastern point at the entrance from seaward and Two Bush Island Lighthouse the western. Matinicus Rock and Monhegan Island Lighthouses are the offshore guides to the entrance (see table, page 18). From eastward the approach is between Seal Island on the south and Saddleback Ledge Lighthouse and Vinal Haven Island on the north; this passage is about 7 miles wide and has few dangers. From westward the bay is entered either through Muscle Ridge Channel (see heading) or through Two Bush Channel, southward of the group of islands lying about **ESE.** from Whitehead.

The best harbor of refuge and the one most readily entered by strangers is Rockland Harbor. Rockport Harbor affords shelter from all but southerly winds. Gilkey Harbor, though small, affords shelter against winds from any direction. **Seal Harbor**, in the southern entrance of Muscle Ridge Channel, is well sheltered and much used by vessels passing in and out of the bay through Muscle Ridge Channel (see page 112).

Rockland Harbor is on the west shore of the bay (see page 123).

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*Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **310, 311**, scale $\frac{1}{40,000}$, price of each $0.25. The entrance from westward is shown on chart **312**, scale $\frac{1}{40,000}$, price $0.25.

Carvers Harbor is in the south side of Vinal Haven Island (see page 122).

Hurricane Sound, The Reach, Leadbetter Narrows, The Basin, Lairey Narrows, and **Old Harbor** are formed by the islands off the southwestern side of Vinal Haven Island, and are described under the heading "Hurricane Sound," page 123.

Crocketts Cove is just eastward of **Crocketts Point**—the southeastern point at entrance to Fox Islands Thorofare; the cove is about 1 mile long and is 200 yards wide at the entrance, which is obstructed by ledges; strangers should not attempt to enter, as better anchorage will be found in Fox Islands Thorofare.

Fox Islands Thorofare makes eastward between Vinal Haven and North Haven islands (see page 103).

Bartletts Harbor is a small cove with deep water and good anchorage, sheltered from all but westerly and northerly winds. It is about 2 miles above Stand-in Point on the western shore of North Haven Island. There is a rock with 9 feet over it exactly in the middle of the entrance; it can be passed close-to as it is small with deep water all around it.

North (Pulpit) Harbor is about 2¼ miles northeastward of Bartletts Harbor; it has a narrow entrance but has good water and affords shelter against all winds. A rock with 10 feet of water over it lies in the middle of the channel nearly ½ mile inside the entrance. The post village of **Pulpit Harbor** is near the head of the harbor.

Clam Cove is a shallow cove making into the west shore of the bay, about 1½ miles north of Rockland Harbor entrance; it is not a good anchorage.

Rockport Harbor, about 3½ miles north of Rockland Harbor, on the west shore of the bay, affords excellent anchorage in 30 to 50 feet of water, sheltered from all but a **SSE.** wind (see page 125).

Camden Harbor, on the west shore of the bay, about 2½ miles north of Rockport Harbor entrance, is a good anchorage with 12 to 30 feet of water, sheltered from all winds (see page 126).

Duck Trap Harbor is a broad open bight in the west shore of the bay, about 5 miles north of Camden Harbor and about 9 miles southward of Belfast Harbor. The town of **Lincolnville** is on the shore of the harbor For sailing directions, see "Sailing Directions, West Penobscot Bay," section 2, par. III, page 119.

Gilkey Harbor is on the western side of South Ilesboro; it is small and of no commercial importance, but is sometimes used as an anchorage for the night. There are two entrances; the one from southward leading between the Ensign Islands and Jobs Island is generally used by vessels going to the anchorage off Dark Harbor, but if entering Gilkey Harbor by this passage caution is necessary when passing Spruce Island; this passage is difficult to navigate at night, and strangers seldom attempt it without a pilot. The northern entrance, marked by **Grindel Point Lighthouse** (see table, page 18), is easy of access, although quite narrow. The usual anchorage for vessels entering by this entrance is about ⅜ mile southeastward of the lighthouse. The harbor is frequently closed by ice during the winter. For directions to enter, see "Sailing Directions, West Penobscot Bay," section 2, paragraph IV, page 119.

Dark Harbor, a post village and summer resort, is on the southern peninsula of South Islesboro, the anchorage being east of Seven Hundred Acre Island and south of Gilkey Harbor, abreast of Ames Cove. This is a good anchorage and is easily entered in the daytime. For directions to enter, see "Sailing Directions, West Penobscot Bay," section 2, paragraph II, page 118.

Seal Harbor, at the southwestern end of North Islesboro and about 3 miles north of Grindel Point Lighthouse, is an excellent anchorage in 20 to 50 feet of water, soft bottom, sheltered from all but southwest winds. This harbor is used by vessels bound up or down the bay as an anchorage for the night, and is easy of access; vessels coming from southward usually pass south of Flat Island; coming from northward they usually pass in between Seal Island and Flat Island. For directions entering, see "Sailing Directions, West Penobscot Bay," section 2, paragraph V, page 119.

Saturday Cove is a small shallow cove in the west shore of the bay, about 3 miles north of Duck Trap Harbor and opposite Seal Harbor. Near the cove is the village of **Northport** and a steamboat landing.

Turtle Head Cove is a broad bight in the north end of North Islesboro; it is sheltered from southerly and easterly winds, and has good anchorage in 18 to 40 feet water, soft bottom. **Turtle Head** is the long, narrow point on the eastern side of the cove, with a hill covered with trees near its northern end. **Marshalls Point,** on the the western side of the cove, is about 25 feet high and bare of trees. The best anchorage is nearest Turtle Head. For directions entering, see "Sailing Directions, West Penobscot Bay," section 2, paragraph VI, page 119.

Belfast Bay, Harbor, and **River** are in the northwestern part of West Penobscot Bay; the entrance of the river is usually known as Belfast Harbor, and the city of **Belfast** is on its southern side (see heading "Belfast Harbor," page 129).

Searsport Harbor is about 3½ miles east of Belfast. It is a broad bight open southward, but it affords good anchorage in 18 to 30 feet of water, soft bottom, sheltered from northerly winds, and is used by all classes of vessels. The town of **Searsport** is at the head of the harbor; the deepest draft of vessels loading here is 12 feet, the average draft about 9 feet; there is a depth of 10 feet at the steamboat wharf at low water. Fresh water

can be obtained alongside the wharves; provisions and some ship-chandler's stores in the town. For directions to an anchorage in Searsport Harbor, see section 2, paragraph VII, page 119.

Long Cove is eastward of Searsport Harbor, between the northwestern shore of Sears Island and the mainland; it has a good anchorage in 6 to 24 feet of water, soft bottom, and is sheltered from all but southwesterly winds.

Stockton Harbor is between Cape Jellison and Sears Island on the western side of entrance to Penobscot River. It is a good harbor, but little used, as it is difficult to enter with a head wind. The village of **Stockton** is at its head.

SAILING DIRECTIONS, WEST PENOBSCOT BAY.

The sailing directions for entering and standing up the bay are good for vessels of the deepest draft, and can be easily followed in clear weather.

1. ***Approaching and Entering, from Eastward.***—Passing ½ mile *N.* of Mount Desert Rock, steer **WNW. ⅝ W.** about 21 miles, and pass about 1¾ miles *S.* of Isle au Haut.

Or, with Long Island Head bearing *N.*, distant 1 mile, steer **W. ⅞ S.** about 14 miles and pass about 1¾ miles *S.* of Isle au Haut.

When Western Ear, the southwestern islet off Isle au Haut, bears *NNW.* distant about 1¾ miles, and the vessel is near the whistling buoy, steer **WNW. ½ W.** about 14½ miles. Heron Neck Lighthouse will then bear *ENE. ½ E.*, distant 4¾ miles. From this position steer **N. ½ W.** until Fisherman Island bears *WSW. ¾ W.*, and at night the red rays of Browns Head Light will be changed to white; then if bound up West Penobscot Bay follow the directions in section 2. Or,

Bound to Castine follow the directions in section 2 A.

Remarks.—Approaching the entrance to Penobscot Bay from eastward, **Isle au Haut**, a large, high, and well-wooded island, will show conspicuously, and is left about 1¾ miles on the starboard hand. Standing across the entrance to East Penobscot Bay, on the **WNW. ½ W.** course, Saddleback Ledge Lighthouse will be left 2 miles on the starboard hand, and the southernmost islands and ledges lying south of Vinal Haven Island about 1¼ miles. **Heron Neck Lighthouse** (see table, page 18) will show conspicuously on the southwestern point of Green Island. Heron Neck whistling buoy will be left about 1 mile on the starboard beam when Heron Neck Lighthouse bears **NE.**

Hurricane Island—high, bare, rocky island **NW.** from Heron Neck Lighthouse—is the most conspicuous island westward of Vinal Haven Island. **Little Hurricane Island** is the small island just westward of Hurricane Island. The Camden Hills will be seen northward on the west shore of the bay.

Standing on the **N. ½ W.** course Hurricane and Little Hurricane Islands and the White Islands will be left nearly 3½ miles on the starboard hand; **Munroe Island**—high and thickly wooded—will be on the port bow. Having stood on this course about 3¾ miles, Owls Head Lighthouse will open northward of Munroe Island. Two small, low, grassy islands will be seen about 2 miles southward of Munroe Island; the northern and larger is **Fisherman Island.** The passage between Fisherman and Sheep islands is **Fisherman Island Passage,** one of the channels leading into Muscle Ridge Channel. On a clear day or at night Browns Head Light, at the entrance to Fox Islands Thorofare, will be made forward of the starboard beam when abreast of Fisherman Island.

Dangers.—**Cold Ledge, Eastern Ear Ledge,** and **Roaring Bull Ledge** are described on page 33.

The numerous rocks and ledges lying south of Vinal Haven Island can be avoided by passing ½ mile southward of the outside islands and ledges that are bare at high water.

Bay Ledge is described on page 33; the sailing line passes about 1 mile northward of it.

Perrys Ledge has 4 fathoms of water over it, and lies nearly 3¼ miles **W. ¼ S.** from Heron Neck Lighthouse. This ledge is not dangerous except to the deepest-draft vessels or during heavy weather when the sea breaks over it at low water.

A spot with a least depth of 10 feet of water over it lies 1⅛ miles **W.** from Little Hurricane Island.

Junken Ledge is described under section 1 A.

Between Little Hurricane Island and the entrance to Fox Islands Thorofare there are many outlying unmarked dangers. To avoid these vessels should keep well over on the western side of the bay, where by keeping a little over ½ mile eastward of the outlying islands no dangers will be encountered.

1 A. *Approaching and Entering, from Westward.—To pass through Muscle Ridge Channel.*—From the whistling buoy north of Monhegan Island, steer **NE.** ¾ **E.** about 14 miles and follow the directions in section 1, "Sailing Directions, Muscle Ridge Channel," page 113.

To pass through Two Bush Channel.—From the whistling buoy north of Monhegan Island, steer **NE.** by **E.** ⅛ **E.** about 13 miles, or until Tennant Harbor Lighthouse bears *NW.* ¼ *W.*; then steer **E.** and pass ⅝ mile south of Two Bush Island Lighthouse. When Whitehead Lighthouse bears *NW.* ½ *W.*, or is in range with Two Bush Island Lighthouse, and the latter is distant 1 mile, steer **NE.** ½ **N.**, taking care not to be set westward, and pass at least ¾ mile eastward of the northeastern end of Andrews Island. When Owls Head Lighthouse bears *NNW.* ½ *W.*, and at night, the red rays of Browns Head Light change to white, follow the directions in section 2, or 2 A, according to destination.

Remarks.—The **NE.** ¾ **E.** course leads for Whitehead Lighthouse and well clear of all dangers until up to the entrance to Muscle Ridge Channel. Burnt Island and the islands off the entrance to Port Clyde will be left well on the port hand. Tennant Harbor Lighthouse will be made on the port bow; Roaring Bull, Hoopers Shoal, and Metinic Island Ledge will be left 1½ miles on the starboard hand in the order named. The bell buoy off the entrance to Muscle Ridge Channel should be made on the starboard bow.

On the **NE.** by **E.** ⅛ **E.** course Roaring Bull buoy should be left 1 mile and Metinic Island Ledge buoy ⅝ mile on the starboard hand. Two Bush Island Lighthouse will be made on the starboard bow.

On the **E.** course Crow Island Ledges buoy and Two Bush Island Lighthouse will be left ⅝ mile on the port hand; the course should be continued until Two Bush Island and Whitehead lighthouses are in range.

Standing into the bay on the **NE.** ¼ **N.** course pass at least ¾ mile eastward of **Andrews Island**, the large island about 2¼ miles **NE.** ¼ **N.** from Two Bush Island Lighthouse; this will clear the ledges and rocks which lie eastward of a line between the islands. After passing Andrews Island, several small, grassy islets will be seen westward, and Sheep and Munroe islands northwestward.

Dangers.—**Roaring Bull** (Black Ledge) is awash at low water and generally marked by breakers; it lies 2¾ miles **WNW.** ¾ **W.** from Metinic Green Island and 7¾ miles **NE.** by **E.** ⅛ **E.** from Monhegan Lighthouse. A buoy (can, black, No. 1) is placed about 100 yards **NW.** from the shoalest part of the ledge.

Hoopers Shoal has a least depth of 17 feet over it and lies 2¼ miles **W.** from the northern end of Metinic Island and 1⅞ miles **NE.** from Roaring Bull.

Metinic Island Ledge is nearly ¼ mile long in an **ENE.** and **WSW.** direction, and has a least depth of 8 feet over it. The ledge lies 1⅞ miles **W.** by **N.** from the northern end of Metinic Island, and is marked off its southwestern end by a buoy (spar, red and black horizontal stripes).

Crow Island Ledges extend 1¼ miles in a **W.** by **S.** direction from Two Bush Island; they consist of several detached rocks with 8 to 15 feet of water over them, and are marked off their western end by a buoy (spar, red, No. 2). This buoy is numbered for the Two Bush Channel, coming from eastward.

Alden Rock, a small, detached rock with 4 feet of water over it, lies about 2¾ miles **ENE.** ¼ **E.** from the northern end of Metinic Island, and 2⅝ miles **S.** ¾ **W.** from Two Bush Island Lighthouse; it is marked by a buoy (spar, red and black horizontal stripes) placed southward of the rock.

Northern Triangles is a group of detached ledges about 1⅛ miles long in an **ESE.** and **WSW.** direction, about 1⅛ miles northward of Little Green Island. Some of these ledges show bare at low water, and the sea breaks on all of them at half tide. Their western end lies ⅞ mile **E.** ¾ **N.** from Alden Rock, and Northern Triangles buoy (can, black, No. 1), which is north of the eastern end of the ledges, lies about 1⅝ miles **NNE.** ⅝ **E.** from the western end of Little Green Island.

Two Bush Reef extends over ¾ mile northeastward from Two Bush Island; it consists of a series of sunken and bare rocks. There is deep water close up to the reef.

Halibut Rock is a small rock, bare at half tide, lying 1¼ miles **NE.** ¼ **E.** from Two Bush Island Lighthouse. About 600 yards **ENE.** from this rock is **Halibut Ledge**, a small ledge with a least depth of 9 feet over it.

Junken Ledge has 4½ fathoms over it, and lies 3⅞ miles **E.** ⅞ **N.** from Two Bush Island Lighthouse and 2⅝ miles **SE.** by **E.** from the northeastern point of Andrews Island. The sea breaks over it in heavy weather.

Northeast Pond Ledge, bare at half tide, lies ⅝ mile **NE.** ¾ **E.** from the northeastern point of Andrews Island, and ¼ mile **S.** by **W.** ¾ **W.** from Crescent Island. About 450 yards **S.** from this ledge is **Sunken Pond Ledge** with a least depth of 6 feet over it.

2. *From abreast Fisherman Island to Fort Point.—I.* When Fisherman Island bears *WSW.* ¾ *W.*, distant nearly 2 miles, steer **N.** by **E.** ¼ **E.** about 8¾ miles, passing ⅞ mile westward of Mark Island. When Negro Island Lighthouse, at the entrance to Camden Harbor, bears *W.* by *N.* steer **NE.** ⅞ **N.** about 11 miles, and when Turtle Head

bears *E.* by *N.*, steer **NE.** by **E.** ¼ **E.** Pass midway between Fort Point Lighthouse and Fort Point Ledge beacon, and round the point, giving it a berth of ¼ mile. When the light bears *W.*, follow the directions in section 3, "Sailing Directions, East Penobscot Bay," page 111, or, the sailing directions for Penobscot River, page 122.

If bound to Rockland, Rockport, Camden, or Belfast, see the different headings.

Remarks and dangers.—On the **N.** by **E.** ¼ **E.** course, standing up the bay, Owls Head Lighthouse will be left 2 miles on the port hand: **Mark Island**—small, high, rounded island, thickly wooded—will be made on the starboard bow. The towns of Rockport and Camden will be opened on the port bow.

Robinson Rock is bare, about 20 feet high, and surrounded by rocks and ledges; it lies ¾ mile **S.** from Mark Island and 3½ miles **ESE.** ⅛ **E.** from Indian Island Lighthouse. This rock and McIntosh Ledge are the southernmost of a chain of rocks, ledges, and islands which extend 5 miles in a northeasterly direction to the southern end of **South Islesboro**. Passing westward of Robinson Rock it should be given a berth of at least ¼ mile.

Porterfield Ledge and **Lowell Rock** are described under heading "Rockport Harbor." The ledges at the entrance to Camden Harbor are described under that heading.

E. Goose Rock is a bare, rocky islet surrounded by ledges, and lies ¼ mile **NNE.** from Mark Island. On its western side it can be approached as close as 175 yards, but there are rocks and ledges between it and **Lasells Island**, the island northeastward.

The Graves is a ledge about 300 yards long and 100 yards wide, showing bare, rocky heads at high water and a large part bare at low water. It is marked by a spindle and lies about ⅞ mile from the western shore of the bay, midway between Indian Island and Negro Island lighthouses. The channel westward of The Graves, between it and **Goose Rock**, the small island westward, is nearly ⅝ mile wide, and has depths of 11 to 16 fathoms.

On the **NE.** ⅞ **N.** course **Seven Hundred Acre Island**, the large island south of Gilkey Harbor, should be left ½ mile on the starboard hand. Duck Trap Harbor will be on the port bow, and **Great Spruce Head**, appearing as a high, rounded, dark headland, sloping toward the water, will be a little on the port bow. The islands eastward of the sailing line will be given a berth of ½ mile, and as the northern end of North Islesboro is approached, the town of Belfast will be opened northwestward at the head of Belfast Bay.

Moxys Reef has 3½ fathoms over it, and lies nearly ⅝ mile from the western shore and 1¼ miles **NE.** by **E.** from Negro Island Lighthouse.

Dillingham Ledge is about 350 yards in diameter and has a least depth of 9 feet over it. It lies ½ mile from the western shore, and 1¾ miles **NE.** ¼ **N.** from Negro Island Lighthouse; it is marked by a buoy (spar, black, No. 1) off its southeastern side.

A small detached spot with 8 feet of water over it lies about ⅝ mile **NNW.** from the southern end of Ensign Islands. This spot is avoided by keeping Great Spruce Head open westward of the western shore of Seven Hundred Acre Island.

Flat Island is a small, bare island on the eastern side of the bay off the entrance to Seal Harbor; it has shoals making out 600 yards northward and about 300 yards southward and eastward. The western side of the island should be given a berth of at least 200 yards.

Seal Island and **Hog Island** lie **NE.** by **N.** from Flat Island, and are connected by shoal water, which also extends northward from Hog Island nearly ⅝ mile. There is a channel about 300 yards wide between the southern end of Seal Island and Flat Island.

Sprague Ledge, with 2 feet of water over it, and **Barley Ledge**, bare at low water, extend in a **NE.** by **N.** direction ⅞ mile above Hog Island. They are avoided by giving the eastern shore a berth of ⅝ mile until 1 mile above Hog Island.

On the **NE.** by **E.** ¼ **E.** course the southern end of Sears Island will be left nearly ⅝ mile on the port hand, and Fort Point Lighthouse will be made ahead; as it is approached, the beacon on Fort Point Ledge will be made a little on the starboard bow.

A **shoal** makes out ⅝ mile **NNE.** from Marshalls Point, the northwestern point of North Islesboro, on the western side of Turtle Head Cove.

A **shoal** makes out nearly ¼ mile **N.** from Turtle Head; it has 13 feet over it at its northern end.

Brigadier Island Ledge has 12½ feet of water near its end, and extends ½ mile westward from the southern point of Sears Island; a part of this ledge is bare 2 hours before low water. A buoy (can, black, No. 1) marks the southwestern point of the ledge.

Sears Island Ledge makes out ¼ mile from the southeastern side of Sears Island, and is partly bare at low water. Its southeastern edge is marked by a buoy (spar, black, No. 3).

A ledge about ½ mile long extends southward from **Squaw Point**, the eastern point at entrance to Stockton Harbor. This ledge is bare at low water for nearly its whole length, and has a small part near the middle bare at all times.

Fort Point Ledge is described on page 122.

II. To the anchorage off Dark Harbor.—When on the **N.** by **E.** ¼ **E.** course standing up the bay, Robinson Rock bears abeam, distant about 1 mile, steer **NE.** ⅛ **N.** On this course

Mark Island and the islands and rocks on the starboard hand should be given a berth of over ¼ mile; the Ensign Islands should be given a berth of ¼ mile, and the vessel will be heading for the eastern end of Seven Hundred Acre Island. When 1 mile above the Ensign Islands, Minots Ledge buoy (spar, black, No. 3) should be left 100 yards on the starboard hand, and the course changed to **NE.** by **E.** ½ **E.** Anchor in 5 to 7 fathoms of water off Ames Cove, with the eastern point of Seven Hundred Acre Island bearing about *WNW.*

III. To anchor in Duck Trap Harbor.—When on the **N.** by **E.** ¼ **E.** course, continue on it past Negro Island Lighthouse until about ⅜ mile from the western shore; then haul a little eastward and follow the shore, keeping at this distance. Leave Haddock Ledge buoy (nun, red, No. 2) on the starboard hand, and anchor ⅜ mile northward of the buoy.

Haddock Ledge, about 150 yards in diameter, has a least depth of 4 feet over it and lies in the middle of the bight, forming Duck Trap Harbor; it lies 2 miles **NW.** by **W.** ¾ **W.** from Grindel Point Lighthouse, and is marked by a buoy (nun, red, No. 2) on its southwestern side.

IV. To anchor in Gilkey Harbor.—On the **NE.** ⅞ **N.** course up the bay, when Grindel Point Lighthouse bears *E.*, or southward of **E.**, steer for it. Stand in past the lighthouse, course about **SE.** by **E.**, giving it a berth of 300 yards on the port hand, and so as to leave a red spar buoy (No. 2) about 25 yards on the starboard hand. From this buoy steer about **E.** by **S.** and anchor 400 yards eastward of it in 4 to 5 fathoms.

The **SE.** by **E.** course leads for a red spar buoy, and midway between the lighthouse and the shore on the south side of the entrance. At low water the ledges show bare a considerable distance from both sides of the entrance, and from the point on the north side abreast the red spar buoy where the channel is very narrow. On the **E.** by **S.** course care must be taken not to approach too close to **Lobster Rock**, which shows bare at about half tide.

V. To anchor in Seal Harbor.—When on the **NE.** ⅞ **N.** course up the bay, and Spruce Head—the eastern point at the entrance to Duck Trap Harbor—bears abeam, steer **ENE.** Pass midway between Flat Island and the eastern shore, and stand into the harbor. Anchor in 5 to 9 fathoms water in the middle or eastern side of the harbor; the northern and western sides are shoal.

VI. To anchor in Turtle Head Cove.—On the **NE.** ⅞ **N.** course, bring the northern end of Turtle Head to bear **E.** and steer for it, and when it is from ¼ to ½ mile distant steer **S.** Anchor in 4 to 6 fathoms water inside the points of the cove, and give the eastern shore a berth of at least 250 yards. The head of the cove is shallow and should not be approached closer than ¼ mile. On the western side of the anchorage is a large shoal making about ⅜ mile northward from Marshalls Point; it is about ⅜ mile wide *E.* and *W.*, and has spots with 3½ to 9 feet over them.

VII. To anchor in Searsport Harbor.—On the **NE.** ⅞ **N.** course when Turtle Head bears *E.* by *N.*, steer **N.** by **E.** ¾ **E.** Stand in and anchor in 3½ to 4½ fathoms, giving the northern shore a berth of a little more than ¼ mile.

2 A. *From abreast Fisherman Island to Cape Rosier.*—When Fisherman Island bears *WSW.* ¾ *W.*, distant 2 miles, steer **NE.** ½ **N.**; this course made good 16½ miles leads into East Penobscot Bay, abreast the northern approach to Eggemoggin Reach, and ½ mile westward of Cape Rosier; then—

If bound up the Penobscot River, steer **N.** by **E.** ½ **E.** and follow the directions in section 3, page 111.

If bound to Castine, follow the directions in section 1, page 128.

Bound to Eggemoggin Reach.—On the **NE.** ½ **N.** course, when Robinson Rock bears *W.*, steer **NE.** ¾ **E.**, with Little Sprucehead Island a little on the starboard bow; when the north end of this island bears *S.*, distant ¼ mile, reverse the directions in section 3, page 95.

Remarks.—On the **NE. ½ N.** course, Drunkards Ledge spindle and **Stand-in Point**—the western point of North Haven Island—will be left ¾ mile on the starboard hand. McIntosh Ledge will be left nearly 1 mile on the port hand, and Goose and Mouse islands will be left about 1⅛ miles on the port hand.

The islands lying eastward of the sailing line will all be left from ½ to 1½ miles on the starboard hand. These islands are bold-to on their western sides, and can be approached as close as 200 yards from this direction. **Mark Island,** the northwesternmost of them, lying 3⅝ miles **SW. ¼ S.** from Cape Rosier, will be made on the starbcard bow and left ½ mile on the starboard hand. The eastern shore of South Islesboro can be approached as close as 400 yards.

Dangers.—**Inner Bay Ledges** are a cluster of rocks and ledges, some of them bare at low water, which lie about 2 miles **SSW. ¾ W.** from Stand-in Point, the western point of North Haven Island. They extend ¾ mile in a **N.** by **E. ½ E.** direction, and are marked by two buoys; Southern End buoy (nun, red, No. 4) and Northern End buoy (spar, red, No. 6). These buoys are left on the starboard hand by vessels bound up the bay.

Drunkards Ledge is bare at half tide, and marked by a spindle (iron, red, cage on top); it lies ⅝ mile **SW.** by **W. ½ W.** from Stand-in Point, and nearly ⅝ mile **WNW. ¼ W.** from Fiddler Ledge beacon. The spindle should be given a berth of at least 250 yards.

McIntosh Ledge has 2 feet of water over it and is about 100 yards in diameter; it lies about ¾ mile **SE.** by **E.** from Robinson Rock, and is marked by a buoy (nun, red and black horizontal stripes) placed southwest from it. There is good water all around the ledge.

Robinson Rock is a large, bare rock, with several smaller detached rocks, all showing bare, lying ¾ mile **S.** from Mark Island. Ledges make out over ¼ mile northeastward and southward from it.

Goose Island is a bare, rocky islet westward of the sailing line, about 1⅞ miles **NE. ¾ E.** from Robinson Rock. The eastern side of this islet should be given a berth of at least ⅝ mile on account of some rocks which show partly bare near high water.

Mouse Island is a small, rocky islet ⅞ mile **NE. ½ N.** from Goose Island. Between these islands lie several ledges showing bare before low water.

Egg Rock is a small, high, dark rock on the eastern side of the sailing line, about 4¼ miles **E.** from the southern end of Mark Island. **Egg Rock Ledge,** with 5 feet of water, lies about ⅝ mile **SSW. ¾ W.** from Egg Rock, and is marked by a buoy (spar, red and black horizontal stripes) placed off its northeastern side.

Compass Island Ledge, with 8 feet of water, is small, and lies 1⅝ miles **E. ¾ N.** from Egg Rock; it is marked by a buoy (spar, red and black horizontal stripes) placed just eastward of the shoalest part of the ledge.

PENOBSCOT RIVER.*

This river empties into the head of Penobscot Bay, and is navigable, at high water, for vessels of 22 feet draft to Bangor, at the head of navigation and tide water, about 24 miles above its mouth. From Fort Point, at its entrance, to Sandy Point, it is about 1 mile wide; above this it narrows rapidly, and at the north end of Whitmores Island its width is about ¼ mile. Above this it is somewhat wider in places, but from Hampden to Bangor some parts of it are not more than 225 yards wide.

Penobscot River has a large shipping trade from Bangor, and some from the towns along its banks. About 2½ miles above Fort Point the river is divided by Whitmores Island into two channels, the principal or main one leading on the west side of the island, and the **Eastern Channel** on the east side; they unite north of Whitmores Island, near the town of Bucksport. Flowing into Eastern Channel from a northeasterly direction is a shallow stream navigable for small coasting vessels and fishermen at high water, to the village of **Orland,** about 2¼ miles above its mouth.

Fort Point Cove, on the western side of the entrance to the river and just north of Fort Point, is full of shoals with 7 to 13 feet of water. The usual anchorage for vessels waiting for wind or tide is in the entrance to this cove.

Bucksport, a town 6½ miles above Fort Point, on the east bank of the river, is the terminus of a branch of the Maine Central Railroad, and the Boston and Bangor line of steamers touch here. There is 18 feet of water at low tide alongside the principal wharves. Bucksport is connected with Whitmores Island by a drawbridge, which crosses Eastern Channel eastward of the principal wharves; width of draw 40 feet in the clear. Anchorage is found off the western end of the town in 5 to 10 fathoms of water.

Marsh River is a shallow, unimportant stream flowing into Penobscot River from a southwesterly direction, about 3 miles above Bucksport; at its mouth it is called **Marsh Bay.** **Frankfort** is a village of little commercial importance on the west bank of Marsh River.

Winterport is a town on the west bank of the river, 12 miles above Fort Point; it is at the head of winter navigation, as ice closes the river 10 to 12 miles below Bangor. The least water in the channel up to Winterport is about 18 feet; there is 20 feet at low water alongside the wharves.

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*Shown on chart 311, scale $\frac{1}{40,000}$, price, $0.25.

Hampden, a small town on the west bank of the river, is 19 miles above Fort Point. The deepest draft that can be taken up to Hampden is 25 feet; there is 9 to 10 feet of water alongside the wharves at low tide. The village of **Orrington** is on the east bank opposite Hampden.

The city of **Bangor** is about 22 miles above Fort Point, on the west bank of the river, and is connected with the town of **Brewer** on the east bank by a toll bridge. It has a large coastwise and foreign trade. The deepest draft of vessels going to Bangor is 22 feet at extreme high tides; 20 feet can be carried up on ordinary high water; the usual draft is 12 feet; 10 feet can be taken up at low water; there is 11 to 14 feet at low water alongside the wharves, with the exception of High Head wharf, which has 22 feet.

Prominent objects.—**Dice Head** is on the northern side of the entrance to Castine Harbor and Bagaduce River; it is easily recognized by **Dice Head Lighthouse** (see table of lights, page 18) and a large observatory a short distance northward of it. **Turtle Head** is the northernmost point of North Islesboro and is about 2¾ miles **NW.** by **W.** ½ **W.** from Dice Head. **Sears Island** lies about 2⅓ miles **N.** by **E.** ½ **E.** from Turtle Head and is recognized by a clearing on the hill on the south side of the island. Searsport Harbor and town are northwestward of Sears Island. **Fort Point**, the easternmost point of Cape Jellison, is distinguished by **Fort Point Lighthouse** (see table, page 18). **Fort Point Ledge beacon** (square, stone, with mast and keg on top), about ⅝ mile **S.** of Fort Point Lighthouse, will show conspicuously when approaching. **Whitmores Island**, 4 miles long in a **N.** and **S.** direction, with a hill 334 feet high near its northern end, is 2½ miles above Fort Point on the eastern side of the main channel of the river. **Fort Knox**, a large, unfinished granite structure on the west bank of the river opposite the northern end of Whitmores Island, is a conspicuous landmark when approaching Bucksport.

The channel of the river is narrow and crooked, requiring local knowledge for its navigation above Bucksport. The depth in places is gradually decreasing, owing to the large amount of refuse from the sawmills on the river above Bangor, which is carried down and deposited on the flats. A bar, with a depth of about 15 feet over it, has formed across the channel about ½ mile above Bucksport; a cut has been dredged through this bar to a depth of 22 feet, but has shoaled and the latter depth is not maintained. This bar may occasion delay at low water to vessels of over 18 feet draft bound to Bangor. Coasting vessels acquainted with the river sail up to Bangor or intermediate places with a fair wind; large vessels tow up on the flood. During the summer months the prevailing winds are from **SW.** Several buoys are placed in the river to mark the edges of shoals. The channel of the river abreast of Bangor and above Crosbys Narrows has been improved by dredging and in 1902 had a depth of 14 feet. The **Eastern Channel** is shallow and chiefly used by small coasters and fishermen when bound to Bucksport or Orland. There are no buoys or other aids to navigation in this channel.

The **usual anchorage** for vessels waiting at the entrance of the river for a towboat or favorable wind and tide is northward of Fort Point on the west side of the channel. Vessels bound up the river anchor anywhere in the channel where soft bottom is found. Vessels towing to Bangor, if the tide does not serve, anchor in **Crosbys Narrows**, about 5 miles below, and wait for a favorable tide.

Pilots for Penobscot Bay and River can be had by making signal off Monhegan or Matinicus islands, or they may be taken from fishermen or coasters off the entrance, or in the bay. There are no regular pilots for the river. Strangers wishing to go above Bucksport should take a pilot or towboat.

Towboats are always taken by large vessels bound up the river; they will generally be found near Fort Point, on the last of the ebb, ready to tow vessels up on the flood. They can be telegraphed for to Bangor from Fort Point or any part of Penobscot Bay having telegraphic communication. Vessels towing up the river do not require a pilot.

Harbor regulations for the port of Bangor are given in Appendix II.

Supplies.—Coal, anthracite and bituminous, can be had alongside the wharves at Bangor, and anthracite coal in limited quantities at Bucksport, Winterport, and Hampden. There is a coaling dock, with 12 feet of water at its end at low water, on the west side of the river, about 3 miles above Fort Point and just above Odoms Ledge beacon. Water is taken from the river at Bangor; below the city it is taken from wells in casks. Provisions can be obtained at any of the above-mentioned places, and ship-chandler's stores at Bangor.

Repairs to vessel's hulls can be made at Bangor, where there is a marine railway, capacity 1,000 tons. Much of the repairing is done on the beaches at low water. Bangor is the only place on the river at which repairs to the machinery of steamers can be made.

Steamers from Boston run to Bucksport, Hampden, and Bangor daily in summer; when the river is closed by ice they run to Bucksport or Winterport. New York steamers run to Bangor in summer and to Bucksport in winter. Small steamers ply between Bangor and the landings on the river and in Penobscot Bay.

Freshets occur in the river during March and April; they are at times dangerous to vessels.

Marine Hospital.—Relief is furnished at Bangor by an acting assistant surgeon of the U. S. Public Health and Marine-Hospital Service as for stations of Class III (see Appendix IV).

Storm warning displays of the United States Weather Bureau are made at Bangor.

Ice obstructs navigation each year above Winterport for nearly 5 months, beginning about December; during extreme cold weather the river is obstructed its entire length.

Tides.—High water occurs at Bucksport 16 minutes later, at Hampden 56 minutes later, and at Bangor 1 hour 14 minutes later than at Fort Point. (See also the table on page 27.)

SAILING DIRECTIONS, PENOBSCOT RIVER TO BUCKSPORT.

When Fort Point Lighthouse is made, steer for it on any bearing between **NNE. ½ E.** and **NE.** by **E. ¼ E.** Give Fort Point Ledge beacon a berth of 300 yards on the starboard hand, and pass about midway between it and the lighthouse, then steer **ENE.** When Fort Point Reef buoy (spar, black, No. 5) bears about *W.* by *N.*, distant about 400 yards, steer **NNE.** and leave Sandy Point Ledge buoy (spar, black, No. 7) about 350 yards on the port hand. When Odoms Ledge beacon is about 400 yards distant on the port beam, steer about **N.** by **W.** Above Odoms Ledge follow a mid-river course and anchor westward of Bucksport, on the northern side of the entrance to Eastern Channel, in 5 to 10 fathoms of water, soft bottom.

Remarks.—The shore for a distance of 2 miles southwestward of Fort Point Lighthouse can be approached as close as 200 yards. The beacon on Fort Point Ledge should be given a berth of 150 yards or more when westward and northward of it. On the **NNE.** course the highest hill on Whitmores Island will be a very little on the starboard bow, and Odoms Ledge beacon will be made on the port bow. The black spar buoy off Sandy Point will be made on the port bow, and about ¼ mile northward of this buoy is a small private buoy, placed to mark a 10-foot rock, which should be left 350 yards on the port hand. The sailing line leads about midway between Odoms Ledge beacon and the east bank of the river.

Dangers.—**Sears Island Ledge** and the ledge off Squaw Point are described on page 118.

Fort Point Ledge is about ⅜ mile long in a **NNW.** and **SSE.** direction off the mouth of the river below Fort Point. It is marked on its northern end by a gray stone beacon lying ⅜ mile **S. ¼ W.** from Fort Point Lighthouse. There is good water on either side of this ledge, but the channel westward is generally used, as it is better marked by the beacon which is closer to deep water.

Fort Point Reef is a rocky ledge making out about 200 yards eastward from Fort Point. It is marked on its end by a buoy (spar, black, No. 5) lying about 350 yards from the lighthouse.

Sandy Point Ledge makes out 600 yards in a southeast direction from **Sandy Point**, the point 1¼ miles **N.** by **E. ½ E.** from Fort Point. It has 4 feet near its end, which is marked by a buoy (spar, black, No. 7). About ½ mile **NE.** by **E.** from the buoy off Sandy Point Ledge and nearly 500 yards from the west bank is a **small 10-foot rock.** A small buoy is placed by private parties to mark this rock.

Unmarked shoals with 17 and 18 feet of water on them, lie from ½ to 1 mile between **E.** by **N.** and **NE.** from Sandy Point Ledge buoy. An unmarked 13½-foot spot lies nearly ½ mile **SE.** from Odoms Ledge beacon.

Odoms Ledge lies near the middle of the river, about 1 mile above Sandy Point; it is ⅜ mile long in a **N.** by **E.** and **S.** by **W.** direction. Its northern end, which is awash at one-quarter ebb, is marked by a black stone beacon lying 3 miles **NNE. ¼ E.** from Fort Point Lighthouse. There is a good channel on either side of it.

CARVERS HARBOR (VINALHAVEN).*

This is a small harbor in the south side of Vinalhaven Island. It is much obstructed by rocks and ledges, and although the most dangerous are buoyed, a stranger should not attempt to enter without a pilot. The village of **Vinalhaven** is at the head of the harbor; it is of some importance for its shipments of granite and fish. There is telegraph and telephone communication, and a steamer runs to Rockland daily. The deepest draft of vessels entering is 12 feet; the greatest depth alongside the wharves is 10 feet.

The prominent features leading up to Carvers Harbor are **Saddleback Ledge Lighthouse** (see table, p. 16) from eastward and **Heron Neck Lighthouse** from westward. **Hurricane Island**—160 feet high, showing white and bare from southward—is about 1¼ miles northwestward of Heron Neck Lighthouse. Several prominent islands, the largest of which are Brimstone, Otter, and Roberts, lie in a broken line between Saddleback Ledge and Heron Neck, and southeast from the entrance to Carvers Harbor.

*Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **310**, scale $\frac{1}{40,000}$, price $0.25.

The channel is narrow and crooked and requires some local knowledge to take a vessel to the anchorage, which is small but well sheltered against all winds, and has a depth of 16 feet, soft bottom, over an area of about 14 acres.

Pilots are on the lookout on shore and will come out to vessels making signal when the weather and sea will permit. Strangers should lie off and on about 1¼ miles southward of Heron Neck Lighthouse until boarded. Pilots are sometimes taken from Rockland by vessels calling there and bound to Vinalhaven.

Supplies.—Water, provisions, and a limited amount of coal may be obtained alongside of the steamboat wharf.

Ice during January and February closes the harbor, but a channel is kept open up to the steamboat wharf.

Tides.—The mean rise and fall of tides is 9.3 feet. (See also table, p. 27.)

Sailing directions of practical value to a stranger can not be given. The chart will be the best guide if a pilot can not be obtained.

HURRICANE SOUND AND ADJACENT WATERS.*

This is the body of water lying between Vinalhaven and Green islands on the east, and Hurricane Island and the White Islands on the west; it has deep water but is little used except by local vessels and the vessels loading granite at Hurricane Island. Several passages lead into the sound between the islands and ledges which surround it, but they are unfit for strangers, and there are no good anchorages. The principal passages into Hurricane Sound lead eastward of Hurricane Island, between it and Green Island, and northward of Hurricane Island, between it and the White Islands; the principal dangers in these passages are marked by buoys.

The Reach is a narrow, much obstructed channel, leading into the sound from southward, between Vinalhaven and Green islands; some of the dangers in this channel are buoyed, but strangers require a pilot.

Lairey Narrows leads into the northern end of the sound, between Leadbetters Island on the north and Pole and Lairey islands on the south. This passage is narrow, and, though some of the dangers are buoyed, strangers should not attempt to enter it.

Leadbetters Narrows is a narrow passage between the Vinalhaven shore on the north and Leadbetters Island on the south; passing south on the eastern side of Leadbetters Island it leads into the northern end of the sound. This passage should not be attempted without a pilot.

The Basin is a large irregular bight in the west side of Vinalhaven Island about 2½ miles north of Heron Neck Lighthouse; **Barton Island** lies in the middle of the entrance, leaving a narrow, crooked, and shallow channel north and south of it. The depth of water in the basin varies from 1½ to 18 fathoms; there are several small islands and rocky ledges near the northern entrance.

Old Harbor is a small cove at the northern end of The Reach, and northeast from the northern end of Green Island; it affords good anchorage for small vessels in 9 to 17 feet of water, soft bottom, but is unsafe for strangers.

It is impossible to give directions that would be of practical use to a stranger in these confined waters.

ROCKLAND HARBOR.†

This harbor, one of the most important in Penobscot Bay, is on the west shore about 8 miles northeastward of Whitehead, between Owls Head on the south and Jamesons Point on the north. It affords anchorage for the largest vessels, but is somewhat exposed to easterly winds; northeasterly winds raise a heavy sea in the southwestern part, but shelter may be found behind the breakwater, which extends ¾ mile in a southerly direction from Jamesons Point, and is about 4 feet above high water. Rockland Breakwater Lighthouse marks the end of the breakwater. The city of **Rockland**, on the western shore of the harbor, has a large trade in lime. Several lines of steamers touch here, and a number of small steamers ply to the islands in the bay. The usual draft of vessels entering Rockland for cargoes is about 12 feet. Some of the wharves are dry, or nearly so, at low water, but there is from 6 to 15 feet alongside the principal ones, according to location. The bottom is soft mud, and some vessels lie aground at low water while loading and unloading.

Rockland is the terminus of a branch of the Maine Central Railroad which connects with the main line at Bath.

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*Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **310**, scale $\frac{1}{40,000}$, price $0.25.

†Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **310**, scale $\frac{1}{40,000}$, price $0.25; **320**, scale $\frac{1}{20,000}$, price $0.20.

Prominent objects.—**Owls Head,** marked by **Owls Head Lighthouse** (see table, page 18), is on the southeastern side of the entrance to the harbor. A little over ¼ mile **NW.** from Owls Head Lighthouse, there is a large black tripod called **Shag Rock Beacon. Jamesons Point,** on the northern side of the entrance, is low and grassy, with a large hotel a short distance back from its end; the breakwater and lighthouse on its end, making off from the point, are conspicuous. **Tillsons wharf** is one of the prominent features after entering the harbor; it is easily recognized by the large building on its end, which has a cupola on its southern gable.

The harbor is easy of access; the principal dangers are marked so that strangers can enter without difficulty.

Anchorages.—Vessels anchor anywhere in the harbor where the depth and bottom are suitable, taking care to keep 300 yards from the end of Tillsons wharf, and leaving a clear channel for the steamboats landing at this wharf. (See Harbor Regulations, Appendix II.)

Pilots are not necessary to enter or leave this harbor, but if desired they can be found off Monhegan or Matinicus, or on any of the fishing vessels off the mouth of the bay. There are no regularly licensed pilots for this port.

Supplies.—Anthracite and bituminous coal can be obtained alongside the wharves. Fresh water can be obtained alongside Tillsons wharf or from a water boat. Provisions and some ship-chandler's stores can be had in the city.

Repairs.—There are two marine railways, one capable of hauling out vessels of 600 tons, the other 400 tons: there are excellent facilities for repairs to wooden sailing vessels and hulls of steamers. Ordinary repairs to machinery can be made here, but Bath is the nearest place affording facilities for extensive repairs.

There are no quarantine regulations for the port. (See quarantine laws for the State in Appendix II.)

Marine Hospital.—Medical attendance is furnished by an acting assistant surgeon of the U. S. Public Health and Marine-Hospital Service, as for stations of Class IV (see Appendix IV). Patients requiring hospital treatment are sent to the U. S. Marine Hospital at Portland.

For **tides** see table, page 27.

SAILING DIRECTIONS, ROCKLAND HARBOR.

1. ***Approaching and Entering, from Eastward or Southward.***—***I. From Eggemoggin Reach.***—Having followed the directions in section 3, page 95, when up to McIntosh Ledge buoy, steer **W.** by **S.** Give the lighthouse on the end of the breakwater a berth of 100 yards or more, and anchor inside the breakwater in 5 to 7 fathoms water.

II. From Fox Islands Thorofare.—Having followed the directions in section 1, page 104, when Fiddler Ledge beacon bears *N.*, distant about ¼ mile, steer **WNW. ¼ W.** Pass about ½ mile north of Owls Head Lighthouse, and stand into the harbor, leaving the lighthouse on the breakwater 100 yards or more on the starboard hand; anchor inside the breakwater in 5 to 7 fathoms water.

III. From Southward in West Penobscot Bay.—Having followed the directions in section 1 or 1 A, pages 116-117, when Fisherman Island bears *WSW. ¾ W.*, distant about 2 miles, steer **N.** by **W. ¾ W.**, passing about ⅜ mile eastward of Munroe Island and Owls Head Lighthouse. When Owls Head Lighthouse bears *SW.* distant about ½ mile, steer about **WNW.** and pass 100 yards or more south of the lighthouse on the breakwater; anchor inside the breakwater in 5 to 7 fathoms water.

IV. From Muscle Ridge Channel.—Having followed the directions in section 1, page 113, round Owls Head, giving it a berth of at least ¼ mile, and when northward of it give the lighthouse a berth of about ½ mile. Then follow the directions in the preceding paragraph.

Remarks.—Standing into the harbor, the breakwater and lighthouse at its southern end should be made on the starboard bow nearly ahead. The buoy marking Spears Rock will be seen on the south side of the harbor. Tillsons wharf is the large stone pier with a brown building at its end, bearing about **WNW. ¼ W.** from the end of the breakwater. Deep-draft vessels entering for the night usually anchor just inside the breakwater and ¼ mile from the south shore of the harbor. Standing westward in the harbor the water shoals gradually toward the wharves.

Dangers.—**Shag Rock** is a cluster of bare rocks about ¼ mile **NW.** by **N.** from Owls Head Lighthouse. A black wooden tripod marks these rocks, which are avoided by giving the south shore a berth of over 300 yards.

Spears Rock, with 3½ feet of water over it, lies about 400 yards from the south shore of the harbor, **S.** by **W.** ¼ **W.** from the end of the breakwater and 1⅝ miles westward of Owls Head. A buoy (spar, black, No. 1) is placed northward of the rock; vessels should not pass southward of the buoy.

Lowell Ledge, bare at low water, is a small cluster of rocks southwestward of Spears Rock and a little closer inshore.

South Ledge lies in the middle of the harbor, about ⅝ mile **SE.** by **E.** ¼ **E.** from the end of Tillsons wharf; it is about ¼ mile long in a **NNW.** and **SSE.** direction, and has been cut down so that there is a depth of 22 feet over it.

Jamesons Point Ledge, lying about 800 yards **ENE.** ¼ **E.** from the northeastern corner of Tillsons wharf, has been removed to a depth of 14 feet.

Railway Ledge is a small rock, with a least depth of about 4 feet over it, lying about 200 yards **ESE.** ¼ **E.** from the end of the marine railway pier, near the southern end of the city; it is marked by a buoy (spar, black, No. 3).

1 A. ***Approaching and Entering, from Northward.***—Standing down West Penobscot Bay, pass ½ mile eastward of The Graves, and steer **SW.** ¼ **S.**; leave the lighthouse on the end of the breakwater 100 to 200 yards on the starboard hand, and anchor behind the breakwater in 5 to 7 fathoms water.

Remarks.—On the **SW.** ¼ **S.** course Rockport Harbor entrance will be passed, and Owls Head Lighthouse will be on the port bow. Rockland Harbor will be gradually opened beyond Jamesons Point, and the breakwater extending southward from the point will be plainly distinguished by the lighthouse at its end, which should be ahead on this course.

For dangers see section 1, preceding.

ROCKPORT HARBOR.*

This is a small harbor on the west shore of the bay about 3½ miles northward of Rockland Harbor; it is easy of access and affords good anchorage for vessels of any size, sheltered from all except **SSE.** winds.

Rockport, the town at the head of the harbor, ships considerable lime. The usual draft of loaded vessels entering is 13 feet; there is 14 feet at low water alongside the lower ice wharf; the other wharves have from 2 to 10 feet.

Prominent objects.—The Camden Mountains are very conspicuous, showing at the head of the harbor when it is approached from southward. **Indian Island Lighthouse** is on the northern side of the entrance (see table, page 18). **Porterfield Ledge beacon** (stone, with mast and barrel on top) is off the entrance and about ¾ mile **S.** by **W.** ¼ **W.** from Indian Island Lighthouse. **Harbor Ledge beacon** (stone, with cask on top) is well up in the head of the harbor; it should not be passed without a pilot.

The **usual anchorage** is southward of Harbor Ledge beacon in 3½ to 7 fathoms, soft bottom. There is good anchorage for light-draft vessels inside Harbor Ledge beacon, but with little room for swinging. There are no harbor regulations, but a general rule to keep out of the fairway when anchored in the inner harbor.

Pilots.—Strangers entering the inner harbor should take a pilot. The piloting is done by fishermen, who will board vessels making signal when off the entrance.

Supplies.—Water can be had at the wharves; provisions and some ship-chandler's stores in the town.

Repairs.—There is a tide dock where vessels can be calked and repairs made to hull.

Ice.—The harbor is frozen near its head in very cold weather, but the ice is not dangerous to shipping.

The **tides** are practically the same as at Rockland (see table, page 27).

SAILING DIRECTIONS, ROCKPORT HARBOR.

1. ***Approaching and Entering, from Southward or Eastward.***—When Indian Island Lighthouse is made steer for it, and when up to Porterfield Ledge beacon (gray stone, with mast and barrel on top) pass it about 200 yards on either hand and bring it to bear *S.*, then steer **N.** for Harbor Ledge beacon. Anchor southward of this beacon in from 3½ to 7 fathoms, soft bottom, or take a pilot if desiring to enter the inner harbor.

*Shown as charts **104**, scale $\frac{1}{80,000}$, price, $0.50; **310**, scale $\frac{1}{40,000}$, price, $0.25; **321**, scale $\frac{1}{20,000}$, price, $0.20.

Remarks.—Standing up the western side of the bay, or coming from Rockland Harbor, care should be taken to avoid the ledges making out from Brewster Point. The western shore of Rockport Harbor is bold-to and may be approached to 200 yards until up to Harbor Ledge beacon.

The **N.** course from Porterfield Ledge beacon leads from 350 to 400 yards westward of Lowell Rock spindle, Indian Island Lighthouse, and Seal Ledge spindle, and approaches the western shore to about 200 yards when halfway between Seal Ledge spindle and Harbor Ledge beacon.

Dangers.—**Brewster Point Ledge** makes out ⅜ mile southeastward from Brewster Point. It is marked on its eastern end by black spar buoy No. 1. There is no safe passage between this buoy and the shore.

Ram Island Ledge makes out about ⅛ mile northward and eastward from Ram Island, the small island **NE.** from Brewster Point. It is marked on its northeastern end by black spar buoy No. 3.

Porterfield Ledge is a small, rocky shoal, bare at low water, lying off the entrance to Rockport Harbor. It is marked by a gray stone beacon, with mast and barrel on top, lying ¼ mile **S.** by **W.** ½ **W.** from Indian Island Lighthouse.

Lowell Rock is small and bare, with ledges connecting it to Indian Island. The ledge southward of the rock is marked by a red iron spindle, with cage and ball on top, lying 300 yards **S.** ½ **W.** from Indian Island Lighthouse. There is a rock with 3 feet of water on it lying about 100 yards **SSE.** from the spindle.

Seal Ledge, dry at half tide, makes out about 200 yards from the eastern shore of the harbor nearly ⅜ mile northward of Indian Island Lighthouse. It is marked by a red iron spindle, with a cage on top.

Harbor Ledge, bare at low water, makes out 200 yards from the western shore of the harbor near its head. It is marked on its eastern end by a gray stone beacon with cask on top. The channel leads eastward of it.

Ship Yard Ledge, bare at low tide, is off the western shore of the inner harbor. It is marked by a black iron spindle, with cage on top.

1 A. ***Approaching and Entering, from Northward.***—When Indian Island Lighthouse is made steer so as to pass about ⅜ mile southward and eastward of it, taking care to avoid The Graves, and give Lowell Rock spindle (red, iron, with cage and ball on top) a berth of nearly ¼ mile. Bring Porterfield Ledge beacon to bear *S.* and head **N.**; anchor as directed in section 1, foregoing.

Dangers.—**The Graves** is a dangerous ledge with rocky heads showing at high water and marked by a spindle. It lies about ⅞ mile from the shore, 1¼ miles **S.** by **E.** from Negro Island Lighthouse and 1¼ miles **NE.** by **E.** ½ **E.** from Indian Island Lighthouse. There is deep water all around it. See also the description on page 118.

For "Remarks" and "Dangers" entering, see section 1, foregoing.

CAMDEN HARBOR.*

This is a small and well-sheltered harbor on the west shore of the bay about 7 miles north of Owls Head, affording good anchorage in 12 to 30 feet of water, good holding ground. It is not much used as a harbor of refuge, but vessels bound up or down the bay frequently anchor here for the night. The town of **Camden** is at the head of the harbor; it has two shipyards for the construction of wooden vessels, a large manufactory for ship's anchors, and several limekilns. The greatest draft of vessels loading here is 15 feet; from 7 to 10 feet draft can be taken into the inner harbor at mean low water. The steamboat wharf has 10 feet of water at low tide, the other wharves from 2 to 6 feet. The harbor is easy of access; the principal dangers are marked by buoys or spindles.

Prominent objects.—The Camden Mountains (the highest, **Mount Megunticook**, 1,320 feet) lie just back of and extend northward of Camden Harbor. **Negro Island Lighthouse** (see table, page 18) is on the southern side of the entrance.

The **anchorage** is in the outer harbor north of Negro Island, in the entrance of **Sherman Cove**, and eastward of a line drawn from the steamboat wharf to Harbor Ledge buoy (spar, black, No. 3).

Pilots are not necessary to enter the outer harbor. Vessels bound up to the wharves and that require a pilot are generally taken up free of charge by stevedores. Strangers desiring a pilot can obtain one by making signal off the entrance.

Supplies.—Anthracite and bituminous coal, in limited quantity, and fresh water can be obtained at the wharves; provisions and some ship-chandler's stores in the town.

Ice sometimes forms in the harbor during January, February, and March, but is not dangerous to vessels in the outer harbor. Westerly winds clear the harbor of ice.

The **tides** are practically the same as at Rockland (see table, page 27).

* See footnote on page 125.

SAILING DIRECTIONS, CAMDEN HARBOR.

1. *Approaching and Entering, from Southward or Eastward.*—Bring Negro Island Lighthouse to bear anywhere between *W.* by *N.* and *N.* by *E.*, except the bearing *N.* by *W.* and a half point each side of it, and steer for it, keeping a bright lookout for The Graves; when nearly up to the lighthouse change course so as to pass about 250 yards eastward of it; when it bears *W.* steer **NNW.**, and anchor midway between Eaton Point and Northeast Point in 4½ fathoms, soft bottom.

Or, stand northward into Sherman Cove and anchor according to the depth.

Dangers.—**The Graves** (see page 118 and section 1 A, page 126).

Negro Island has shoal water on all sides, and there is no safe passage between it and Metcalf Point. **A rock** with 16 feet of water on it lies 150 yards **SE. ¼ E.** from the lighthouse. The shoals off the northern end of the island are marked by Harbor Ledge buoy (spar, black, No. 3), which lies ¼ mile **N.** by **W. ¼ W.** from the lighthouse, and should be left about 250 yards on the port hand, when on the **NNW.** course.

Northeast Ledges (inner and outer) extend in a southerly direction from Northeast Point, and contract the entrance of the harbor to about ¼ mile. They are partly exposed at half tide, and the **outer ledges** are marked on their northern end by black spar buoy No. 1, and a black bell buoy. **Inner Ledge** is marked by a black iron spindle with cylinder on top, ⅜ mile **NE.** by **N.** from Negro Island Lighthouse. The southern end of these ledges is marked by red spar buoy No. 2, placed 300 yards **SSE.** from it, and the southwestern end by a red spar buoy, No. 4.

1 A. *Approaching and Entering, from Northward.*—Standing down West Penobscot Bay, give the western shore a berth of about 1 mile, and when Negro Island Lighthouse bears **W.** by **N.** head for it, passing southward of red spar buoy No. 2, and when 300 yards distant from the lighthouse, steer **NNW.** and follow the directions in section 1, foregoing.

Remarks.—There is a narrow passage, called **Northeast Passage,** between Northeast Point and Northeast Ledges. The channel leads about midway between the spindles marking the ledges, but it is so narrow and obstructed that strangers are advised not to attempt it.

Dangers.—**Dillingham Ledge** is a rocky shoal about ¼ mile from the west shore of the bay, with 9 feet of water on it and marked on its southeastern side by black spar buoy No. 1; see page 118.

Moxys Reef is an unmarked 21-foot spot 1¼ miles **NE.** by **E.** from Negro Island Lighthouse, and ⅛ mile from shore.

For description of remaining dangers see section 1, foregoing.

BAGADUCE RIVER AND CASTINE HARBOR.*

The Bagaduce River empties into the eastern side of East Penobscot Bay about 23 miles from Saddleback Ledge Lighthouse and about 4½ miles northward of the southwestern point of Cape Rosier. The entrance abreast the town of Castine is known as **Castine Harbor.** On the northern side of the entrance is **Dice Head Lighthouse** (see table, page 18). This river is about 14½ miles long, with a narrow, crooked channel and several large bays and coves, the principal being **South Bay, Northern Bay,** and **Smiths Cove**; the latter is a good anchorage southeastward of Castine. About 3 miles above its mouth, a short distance above West Brooksville, the river is narrow, full of ledges and the tidal currents so strong that it is not navigable except near slack water. A local knowledge of the river is necessary for its navigation, and strangers should not attempt to go above Castine without a pilot. The river is usually free from ice at Castine and for some distance above, but in very severe winters it is entirely closed.

Castine, a town on the north bank about 1 mile east of Dice Head, has little commerce. Vessels of the deepest draft can enter Castine Harbor and find anchorage sheltered from all winds, but the bottom is irregular; there is 16 to 18 feet alongside some of the wharves at low water. Castine has steamboat communication with some of the islands, and with several harbors on the bay. Pilots are not necessary for entering the harbor, but one may be obtained by signaling off the entrance. Vessels desiring pilots for the river above Castine can get one at the town. Tugs are not used by vessels entering the river but may be had from Bangor.

*Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **311**, scale $\frac{1}{40,000}$, price $0.25.

West Brooksville is a village on the east bank of the river about 2¾ miles above its mouth; there is 30 feet at low water in the channel up to the village. A steamer to Castine touches here daily.

South Penobscot, a village on the east shore of Northern Bay, is about 7½ miles above the mouth of the river. Only small local vessels go there.

Prominent features.—Dice Head, marked by Dice Head Lighthouse (see table, page 18), is on the northern side of the entrance. **Holbrooks Island**—covered with trees except on the northwestern point, which is cleared and remarkably bare looking—lies ⅞ mile **S.** of Dice Head Lighthouse on the south side of the entrance. **Nautilus Island** lies about ⅝ mile **SE.** of Dice Head Lighthouse on the south side of the entrance. **Hosmer Ledge monument** is of stone, with pole and cask on top, erected on Hosmer Ledge on the south side of the harbor.

The channel is about 400 yards wide at the entrance and abreast of Castine; above this it widens a little to the anchorage in Smiths Cove. The principal dangers are marked by buoys.

The **best anchorage** is in Smiths Cove in 4 to 11 fathoms, soft bottom, sheltered from all winds. The holding ground abreast the town is not good, and the general depth of water is about 12 fathoms.

Supplies.—Anthracite coal in limited quantity and fresh water can be had at the wharf at Castine; provisions can be obtained in the town.

Marine Hospital.—Relief is furnished under the provisions of the regulations of the U. S. Public Health and Marine-Hospital Service as for stations of Class IV. (See Appendix IV.)

For **tides** see table, page 27.

SAILING DIRECTIONS, CASTINE HARBOR.

1. ***Approaching and Entering, from Southward.***—Having followed the directions in section 2, "Sailing Directions, East Penobscot Bay," or section 2 A, "Sailing Directions, West Penobscot Bay," when Dice Head Lighthouse is made, steer for it on any bearing between **NNE. ½ E.** and **NE. ¼ N.** When the lighthouse is about 1 mile ahead, steer more eastward until Otter Rock Shoal buoy (spar, black, No. 1) is made, then steer so as to pass about midway between it and Nautilus Island.

When Otter Rock Shoal buoy (spar, black, No. 1) bears *N.*, distant about 150 yards, steer **ENE. ½ E.**, leaving Hosmer Ledge monument about 200 yards on the starboard hand. When Middle Ground buoy (spar, red, No. 2) bears about *NE.*, distant 300 yards, steer **SE.** by **E. ½ E.**, heading for the end of Henrys Point. Anchor in 4½ to 11 fathoms water from 200 to 500 yards westward or southwestward of the point.

Remarks.—Approaching the entrance, the western shores of Holbrooks and Nautilus islands should be given a berth of at least 150 yards. On the **ENE. ½ E.** course **Henrys Point**—bearing **E. ½ S.** from Hosmer Ledge monument—will be seen on the starboard bow; the town of Castine will be on the port bow, and Smiths Cove will be opened southeastward as the town is approached.

Dangers.—**Otter Rock Shoal**, making southeastward nearly ¼ mile from Dice Head, is marked at its southern edge by a buoy (spar, black, No. 1).

Shoals make northward and eastward from Nautilus Island, connecting it with the mainland. They may be avoided by giving the shore a berth of 200 to 300 yards.

Hosmer Ledge, bare at half tide, and marked by a stone monument with pole and cask on top, lies on the south side of the channel ⅞ mile **ESE.** from Dice Head Lighthouse.

Middle Ground shows partly bare at low water, and lies off the upper end of the town. It is about ¼ mile long in an **ESE.** and **WNW.** direction, and is marked by a buoy (spar, red, No. 2) off its western side.

A small unmarked 15-foot shoal lies at the entrance of Smiths Cove, 800 yards **E. ¼ N.** from Hosmer Ledge monument. It may be avoided by giving Hospital Island a berth of ¼ mile.

There are several unmarked shoal spots off the western side of Smiths Cove, about ⅜ to ½ mile **S.** by **W.** from Henrys Point.

1 A. ***Approaching and Entering, from Northward.***—When Dice Head Lighthouse is made, steer for it. Give Dice Head a berth of ¼ mile while westward and southwestward of it, and shape a course so as to pass about midway between Nautilus Island and Otter Rock Shoal buoy (spar, black, No. 1), then follow the directions in section 1, preceding.

See the remarks and dangers under section 1, preceding.

BELFAST HARBOR.*

This is formed by the mouth of the Belfast River at the head of Belfast Bay, in the northwestern part of West Penobscot Bay. It affords good anchorage, but is exposed to southeasterly winds. The city of **Belfast** on its southwest side is now of little commercial importance. The deepest draft of vessels entering is 12 feet; 10 to 11 feet is the usual draft; there is from 5½ to 11 feet of water alongside the wharves.

Citypoint is a village about 2 miles above Belfast, at the head of navigation on Belfast River; a few vessels of 6 to 10 feet draft go up at high water, passing through two drawbridges; the lower one, long bridge, crosses the river at Belfast, and the upper bridge crosses about ¾ mile farther up the river; the width of the draws is about 32 feet. The river is narrow and shallow and requires local knowledge for its navigation to Citypoint. Belfast and Citypoint are on a branch of the Maine Central Railroad. Steamers touch at Belfast on their way to and from Bangor.

Prominent objects.—The houses and church steeples of the city of Belfast will be seen as soon as the northern end of North Islesboro is approached. Standing into Belfast Bay the stone beacon on Steels Ledge will be seen toward the northern side of the bay near the entrance of Belfast River, and the red roof and yellow building on the steamboat wharf show prominently on the south side of the harbor. Belfast Harbor is easy of access. The principal dangers are marked.

Anchorage.—The best and usual anchorage is in the channel between the lower steamboat wharf and the bridge in 10 to 15 feet.

Pilots.—Strangers bound to Belfast desiring a pilot take one outside (see directions in regard to pilots, Penobscot River, page 121). Vessels unable to get a pilot in the bay should anchor southwestward of Steels Ledge beacon until boarded by one.

Towboats are seldom used, but may be had from Bangor or Bucksport by telegraphing.

Supplies.—Anthracite and bituminous coal in limited quantity, and fresh water, can be obtained alongside the wharves. Provisions and ship-chandler's stores in limited quantity can be had.

Repairs.—There is one marine railway capable of hauling out vessels of 400 tons; also good facilities for repairs to hulls of wooden vessels. Ordinary repairs to machinery can be made, but Bangor is the nearest place where extensive repairs to machinery of steamers can be made.

Marine Hospital.—Relief is furnished by the U. S. Public Health and Marine-Hospital Service as for stations of Class IV. (See Appendix IV.)

Ice obstructs navigation from February to April; sometimes the whole bay is frozen across to Islesboro.

For **tides** see table, page 27.

SAILING DIRECTIONS, BELFAST HARBOR.

1. ***Approaching and Entering, from Southward.***—Having followed the directions in section 2, "Sailing Directions, West Penobscot Bay," until abreast of Great Spruce Head, steer about **NNE.** and change the course as necessary to follow the western shore, giving it a berth of about ½ mile. When Steels Ledge beacon (gray stone with pole and barrel on top) is made bring it to bear **N.**, and steer for it until it is ⅝ mile distant, then steer **NW.** ½ **N.** and anchor southward of Patterson Point in 16 to 21 feet of water, soft bottom.

Vessels of 10 feet or less draft may continue the **NW.** ½ **W.** course up to the steamboat wharf, which should be left 150 yards on the port hand; then follow the line of the wharves at a distance of about 100 yards. Vessels of greater draft should take a pilot.

Remarks.—On the **N.** course South Point Steels Ledge buoy (nun, red, No. 2), will be nearly in range with Steels Ledge beacon and should be distant ¼ mile when the course is changed to **NW.** ½ **N.** The western shore of the bay is comparatively bold-to and may be approached to ¼ mile except in the cove off the entrance to Little River. The northern shore, for a distance of ¾ mile eastward of Steels Ledge, should be given a berth of ½ mile.

*Shown on charts **104**, scale $\frac{1}{80,000}$, price $0.50; **311**, scale $\frac{1}{40,000}$, price $0.25; **319**, scale $\frac{1}{20,000}$, price $0.20.

Dangers.—**Steels Ledge**, with 8 feet of water on it, is on the northern side of the entrance to the harbor and extends about ¼ mile in a **NNW.** and **SSE.** direction. It is marked on its northern end by a buoy (spar, red, No. 4) and a beacon near its southern end. There is no safe passage between this buoy and the northern shore. The southern end is marked by a buoy (nun, red, No. 2) lying 300 yards southward of the beacon.

1 A. ***Approaching and Entering, from Eastward.***—From a position about ½ mile southward of Sears Island steer **W.** by **N.** and pass ⅜ mile southward of Steels Ledge beacon; then follow the directions in section 1, foregoing.

Or, from a position about ½ mile northward of Turtle Head, steer **NW.** by **W.** ½ **W.** and pass about ⅜ mile southward of Steels Ledge beacon; then proceed as directed in section 1, foregoing.

Remarks.—There are no dangers approaching from eastward, except Brigadier Island Ledge, described on page 118. The dangers at the entrance of the harbor are described under section 1, foregoing.

UNITED STATES COAST PILOT.

ATLANTIC COAST—PART II.

FROM WHITEHEAD TO CAPE ANN.

COAST OF MAINE, NEW HAMPSHIRE, AND MASSACHUSETTS, FROM WHITEHEAD, ME., TO CAPE ANN, MASS.*

Note.—For description of Gulf of Maine, see pages 11–12; for sailing directions along the coast from the St. Croix River to Cape Ann, see pages 13–14.

From Whitehead to Cape Elizabeth, a distance of 58 miles, the general direction of the coast is about **WSW.** ¾ **W.**; it then changes to **SW.** ¼ **W.** for a distance of 47 miles, to Great Boars Head, near Hampton, N. H. From Great Boars Head the coast trends about **S.** by **W.** for a distance of 6½ miles, to the Merrimac River, then more southward, and southeastward for a distance of 7 miles to Ipswich Harbor, and from thence eastward and northeastward to Cape Ann, forming the bight known as Ipswich Bay. The direction and distance from Whitehead, Me., to Cape Ann Lighthouses, Mass., is **SW.** ¾ **W.**, about 102 miles.

Between Whitehead and Cape Elizabeth the coast is rocky and very much broken by numerous bays and rivers, many of which are excellent harbors. These indentations, and the islands lying in them, have a general **NNE.** and **SSW.** direction. In Muscongus and Casco bays good channels lead between the islands, affording inside passages that are much used by the smaller class of vessels passing along the coast. Great caution is necessary when standing along this stretch of the coast in thick weather on account of the numerous dangers which in some cases lie nearly 10 miles offshore. Between Cape Elizabeth and Great Boars Head there are fewer harbors and marked indentations; the latter are generally broad bights with strips of sand beach between well-marked rocky points. The shore is more thickly settled than farther eastward, several of the beaches being popular summer resorts. The outlying dangers are well marked and fewer in number. Southward of Great Boars Head the coast is low and generally a sandy beach, with a few outcropping ledges and outlying dangers, but the northern shore of Cape Ann is high and rocky.

Harbors and anchorages.—The principal harbors of refuge are: Tennant Harbor, Port Clyde, Boothbay, Ebenecook Harbor in Sheepscot River, Harpswell Sound, Portland Harbor, and Portsmouth Harbor; these and other harbors along the coast are described under their separate headings.

Prominent features.—*Monhegan Island,* lying 9¼ miles from the mainland, is 160 feet high and a mark for all vessels bound into Penobscot Bay from westward. *Seguin Island* lies about 2¼ miles from the mainland off the mouth of the Kennebec River; the island is about 145 feet high and a mark for vessels bound into the river or standing along the coast. *Cape Elizabeth,* the southern point at the entrance to Portland Harbor, is about 90 feet high. *Agamenticus Mountain* is 728 feet high and the most prominent landmark between Portland and Cape Ann. It is about 4½ miles inland and 9 miles northeastward of Portsmouth. The *Isles of Shoals,* lying about 5½ miles from the shore and southeastward of Portsmouth Harbor entrance, can be seen a long distance, the large hotels being conspicuous marks. *Boon Island Lighthouse* is about 9 miles northeastward from the Isles of Shoals and about 6½ miles offshore. *Cape Ann,* at its northern end, is high, but its eastern end is comparatively low. The two light-towers on Thatcher Island are the most conspicuous marks seen when approaching the cape.

*Shown on charts **1000,** Sailing Chart, Mercator projection, Deg. Lat.=3.7 inches; **6,** General Chart of the Coast, scale $\frac{1}{400,000}$; **105, 106, 107, 108,** scale $\frac{1}{80,000}$, price of each $0.50.

Lights and other aids.—At night, in clear weather, no difficulty should be experienced by vessels approaching or standing along the coast, as the lights are numerous and can be readily distinguished (see table, pages 16–23). Vessels approaching the coast will sight some of the lights before approaching any of the outlying dangers. Buoys or spindles mark the principal dangers along the coast and in the channels most frequently used. The buoys accord with the system adopted in United States waters (see page 5). In thick weather special attention should be paid to the fog signals at the different lighthouses, and bell and whistling buoys. (See also "Aids to navigation," page 13.)

Lines defining limits within which the Inland Rules of the Road apply are given on page 13.

Pilots.—Pilotage is not compulsory for ports in the State of Maine. Fishermen and others competent to take vessels into the ports of the State can usually be found along the coast; they will board any vessel making the pilot signal. There are licensed pilots for the port of Portland (see "Pilots" under heading Portland Harbor, and Appendix II).

Pilotage is not compulsory for enrolled or registered vessels of the United States in the ports of New Hampshire, and only for other vessels when a pilot offers his services. (See Appendix II.)

Pilotage is compulsory for ports in Massachusetts except for steam vessels regulated by the laws of the United States and carrying a pilot commissioned by United States Commissioners, vessels regularly employed in the coasting trade, fishing vessels other than whalers, and vessels of less than 7 feet draft of water. All other vessels are obliged to pay pilotage.

Towboats can be had at Wiscasset, in the Kennebec and Merrimac rivers, and in Portland and Portsmouth harbors. (See also "Towboats" under the different headings.)

Quarantine.—The quarantine laws for Maine govern the ports in that State and local boards of health have the power to make quarantine regulations for the ports under their control. Health officers in the State of New Hampshire have authority to make regulations respecting quarantine for ports in the State. The Board of Health in each seaport town of Massachusetts has authority to regulate quarantine for the port. For quarantine laws, see Appendix II.

Harbor control.—For ports in the State of Maine, local municipal officers have the power to appoint harbor masters; port wardens are elected by the city or town. The city of Portsmouth provides a harbor master for Piscataqua River and Portsmouth Harbor. Harbor masters are appointed for ports in Massachusetts; they have charge of the anchorage and berthing of vessels. For harbor control and regulations, see Appendix II.

Marine Hospital.—There is a U. S. Marine Hospital at Portland. Relief stations of Class III of the U. S. Public Health and Marine-Hospital Service are at Boothbay Harbor, Me., and Portsmouth, N. H., and a relief station of Class IV at Bath, Me.: at each of these places an acting assistant surgeon of the service is stationed. At Waldoboro and Wiscasset, Me., are emergency relief stations of Class IV. (See Appendix IV.)

Supplies.—Coal can be obtained in quantities at Bath, Portland, and Portsmouth. Water, provisions, and ship-chandler's stores can be obtained at these places and at a number of smaller towns. (See "Supplies," under the different headings.)

Repairs.—Bath and Portland are the principal places at which extensive repairs to the hulls of vessels and machinery of steamers can be made. Minor repairs can be made at several other places. (See "Repairs," under the different headings.)

For **ice, fogs, winds, tides,** and **freshets,** see pages 14, 27, and 28.

Tidal currents.—In standing along the coast well inshore, allowance should be made for the tidal currents. The flood sets eastward and into the bays and rivers, and the ebb westward and out of the bays and rivers. Between Penobscot Bay and Cape Ann the westerly (ebb) set is usually the most marked, and between Portland and Cape Ann this is allowed for in thick weather by vessels making regular trips along this part of the coast. See also page 28.

For "General remarks on approaching and standing along the Coast of Maine," and "Sailing Directions from St. Croix River to Cape Ann," see pages 28–37.

TENNANT HARBOR.*

This is an excellent anchorage, and is much used as a harbor of refuge. It lies 3 miles **W. ½ S.** from Whitehead, and its entrance is marked by **Tennant Harbor Lighthouse** (see table, page 18.) It is open eastward, and an easterly gale raises a choppy sea in the harbor, but vessels with good ground tackle can ride in safety. The village of **Tennant Harbor** is on the northern shore, near the head of the harbor; vessels of 10 feet draft can go alongside of the wharves, but they lie aground at low water. The channel is free from dangers, and shoals gradually westward.

*Shown on charts **105**, scale $\frac{1}{80,000}$, price $0.50; **312**, scale $\frac{1}{40,000}$, price $0.25.

Long Cove, making northward from the entrance of Tennant Harbor, has several stone quarries where vessels load granite; 10 feet is their usual loaded draft.

Anchorage.—Deep-draft vessels may anchor midway between the western ends of Northern and Southern islands; light-draft vessels anchor more toward the head of the harbor. The bottom is mostly soft mud, and good holding ground.

Pilots.—Vessels entering for an anchorage do not require a pilot; strangers bound to the quarries in Long Cove take one from Northern Island.

Supplies.—Anthracite coal in limited quantity, provisions, and some ship-chandler's stores can be obtained here.

Repairs.—There is a marine railway capable of hauling out vessels of 500 tons, length of cradle 120 feet on blocks; extreme draft of vessels taken out, 11 feet. There are also some facilities for repairing wooden vessels.

Ice seldom obstructs the harbor; during extremely cold weather it is sometimes frozen over for a few days.

The **tides** are practically the same as Port Clyde (see table, page 27).

SAILING DIRECTIONS, TENNANT HARBOR.

1. ***Approaching and Entering, from Eastward.***—*Coming from Muscle Ridge Channel.*—When the bell buoy off South Breaker bears *SE.*, distant about 350 yards, steer **W. ¾ N.**; pass about ¼ mile northward of Tennant Harbor Lighthouse and midway between Northern and Southern islands. Anchor about ¼ mile *ESE.* from the stone wharf, on the northern side of the harbor, in 21 feet water, soft bottom. Deep-draft vessels can anchor farther eastward. Give the southern shore of the harbor a berth of 250 yards; the northern shore is bold-to eastward of the stone wharf.

Coming through Two Bush Channel.—From a position about ¼ mile southward of Crow Island Ledge buoy (spar, red, No. 2) steer **NW.** by **W ½ W.**; pass about ¼ mile northward of Tennant Harbor Lighthouse, and when midway between Northern and Southern islands steer **W. ¾ N.** and anchor as directed in the preceding paragraph.

Remarks.—Approaching Tennant Harbor from eastward Tennant Harbor Lighthouse, on **Southern Island**, should be a little on the port bow. The channel to Long Cove lies 150 to 200 yards westward of the southwest end of **Northern Island**, the island on the north side of the entrance; westward of this channel is a long ledge, awash at half tide, which extends ¼ mile eastward from the western point at the entrance to Long Cove.

Dangers.—**Norton Island Ledges**, a large unmarked shoal, with places bare at low water, lies ¾ to 1 mile **W.** from Whitehead Island and should be left about ⅝ mile on the starboard hand coming from Muscle Ridge Channel.

Seaveys Ledges, an unmarked shoal about ¼ mile westward of Norton Island Ledges, has some spots bare at low water and should be left about ¼ mile on the starboard hand when on the **W. ¾ N.** course.

On the northern side of the harbor, westward of the first stone wharf, are several spots with 4 to 9 feet over them.

There are no dangers approaching Tennant Harbor on the **NW.** by **W. ½ W.** course. Southern Island should be given a berth of at least 150 yards.

1 A. ***Approaching and Entering, from Westward.***—Follow the directions in section 1 A, "Sailing Directions, West Penobscot Bay" (page 117), and when Tennant Harbor Lighthouse bears **N.** by **E.** steer for it, and when nearly up to it haul eastward and round the lighthouse, giving Southern Island a berth of 200 to 300 yards. When the lighthouse bears *S.*, steer so as to pass midway between Northern and Southern islands; then steer **W. ¾ N.** and anchor as directed in section 1, foregoing.

Harts Ledge, with spots bare at low water and unmarked, makes out ¼ mile eastward from Harts Neck, ¾ mile **SW.** by **S.** from Tennant Harbor Lighthouse.

PORT CLYDE.*

Port Clyde is an excellent though small harbor and anchorage, lying between Marshall Point and Hooper Island, and about 9½ miles **NNE. ¾ E.** from Monhegan; it is used as a harbor of refuge by fishermen and coasters. **Marshall Point Lighthouse** (see table, p. 18) is on the eastern point at the southern entrance to the

* See footnote page 132.

harbor. A bar obstructs the northern entrance; vessels of 15 feet draft have been taken over this bar at high water by local pilots, but strangers should not attempt to cross it. The village of **Port Clyde** is on the eastern shore; there are two wharves here which have from 12 to 14 feet of water at their ends at high water, but vessels lie aground at low water.

Channels.—The channel leading into Port Clyde from eastward, between Mosquito Island and Hay Ledge, has good water with the principal dangers marked by buoys. The channel from southward, between Gunning Rocks and Harts Island, leads between several unmarked shoal spots; the lighthouse is the guide for entering by this channel. The channel from westward through Davis Straits has its most prominent dangers buoyed, but is quite narrow northward of Davis Island and at the entrance to the harbor.

The anchorage is anywhere in the channel inside of Marshall Point, in 8 to 6 fathoms, good holding ground, keeping out of the bight which makes eastward just north of the point.

Pilots can be obtained by making signal and lying off The Brothers, but they are not necessary for entering the harbor unless bound in from northward across the bar, when a pilot should be taken off Hooper Point; or, coming from westward one may be taken at Franklin or Harbor islands.

Towboats can be had by telegraphing from Tennant Harbor, distant 4 miles, to Rockland or Bath; but vessels do not require one unless disabled.

Supplies.—Anthracite coal in limited quantities and water can be had alongside the wharf. Provisions can be obtained in the village.

Repairs.—There is one marine railway capable of hauling out vessels of 400 tons and 10 feet draft; also good facilities for repairing wooden vessels.

Ice does not usually interfere with navigation; in very severe winters the harbor may be frozen over for a short time.

Storm warning displays of the United States Weather Bureau are made at Marshall Point Lighthouse (see Appendix III).

Tides.—See table page 27.

SAILING DIRECTIONS, PORT CLYDE.

1. *Approaching and Entering, from Eastward.*—Having come through Muscle Ridge Channel, steer **SW.** by **W.** ½ **W.** Or, having come through Two Bush Channel from a position about ½ mile south of Two Bush Island Lighthouse, shape the course about **W.** ½ **S.**, so as to pass about 400 yards south of the southeastern point of Mosquito Island and close to the red bell buoy. When Marshall Point Lighthouse bears **NW.** by **W.** ¾ **W.** steer for it; leave Mosquito Island 400 yards on the starboard, and The Brothers at least 250 yards on the port hand. Pass northward of Gunning Rocks buoy (spar, black, No. 1) and change course to **W.** ½ **N.**, passing about 100 yards southward of Marshall Ledge buoy (spar, red, No. 4). Then haul northward, giving Marshall Point a berth of 200 to 300 yards, and enter the harbor in mid-channel. Then steer about **NE.** by **N.** so as to leave Hooper Island Ledge buoy (spar, black, No. 1) about 100 yards on the port hand; anchor off the wharves at Port Clyde in from 3½ to 5 fathoms of water, soft bottom.

Remarks.—**Mosquito Island** is a large wooded island about 3 miles **SW.** from Tennant Harbor Lighthouse. Coming from Two Bush Channel, or Muscle Ridge Channel, there are no dangers until up with Mosquito Island, which has ledges and shoals making out on every side; it should not be approached nearer than 200 yards on its eastern or southern sides, and during a heavy easterly sea it should not be approached closer than 400 yards.

In approaching from eastward do not allow Marshall Point Lighthouse to fall northward of **NW.** by **W.** ¼ **W.** until after passing black buoy No. 1. This will clear Barters Shoal and the ledges off the north end of The Brothers. On the **NW.** by **W.** ¾ **W.** course black buoy No. 1 should be a little on the port bow, and Mosquito Island Ledge buoy (spar, red, No. 2) should be on the starboard bow, and be left about 400 yards on the starboard hand.

The **W.** ½ **N.** course leads about 100 yards southward of red buoy No. 4, and should be continued about 200 yards beyond it before the course is changed northward.

Dangers.—**Hay Ledge** is a small, bare, rocky island lying a little over ¼ mile **SW.** by **W.** ½ **W.** from Mosquito Island; it is surrounded by ledges and should be given a berth of 250 yards.

Barters Shoal is an unmarked pinnacle rock, with 15 feet of water over it, lying nearly midway between Mosquito Island and Hay Ledge. It bears **SW.** by **W.**, distant 700 yards from the southeastern point of Mosquito Island, and the sea breaks on it in a heavy easterly gale.

The Brothers are three small, rocky islands northwestward of Hay Ledge. They are surrounded by ledges and should not be approached closer than 200 yards on their eastern and northern sides.

Gunning Rocks have ledges with 4 feet of water over them making out 400 yards in a **NE.** by **N.** direction. They are marked on their northern end by a buoy (spar, black, No. 1) lying about ⅛ mile **SE.** by **E.** ¼ **E.** from Marshall Point Lighthouse.

Mosquito Island Ledge has 7 feet of water over it and lies ¾ mile **E.** by **S.** from Marshall Point Lighthouse; it is marked on its southern end by a buoy (spar, red, No. 2).

Marshall Ledge, with 15 feet of water over it at its outer end, makes out in a southerly direction about 275 yards from Marshall Point. It is marked on its southern end by a buoy (spar, red, No. 4). Vessels should not pass between the buoy and Marshall Point.

Hooper Island Ledge, with 5½ feet over it, extends 300 yards eastward from Hooper Island, nearly ⅜ mile northward of the lighthouse. It is marked on its eastern side by a buoy (spar, black, No. 1).

Unmarked rocky shoals and ledges obstruct the bight on the eastern side of the harbor northward of Marshall Point.

1 A. ***Approaching and Entering, from Southward.***—With the eastern end of Mosquito Island bearing northward of *NE.* ¼ *E.*, bring Marshall Point Lighthouse to bear **N.** ¾ **W.** and head for it on that bearing. This course leads close to Old Cilley Ledge bell buoy; continue the course from the buoy, passing 150 to 200 yards westward of Gunning Rocks; when these bear southward of *E.* haul westward and steer so as to pass 200 to 300 yards westward of Marshall Point, and proceed as directed in section 1, foregoing.

Dangers.—**Old Cilley Ledge** is a dangerous ledge about ½ mile long in an **E.** by **S.** and **W.** by **N.** direction, with both ends dry at low water; it lies about 1½ miles **ENE.** from Burnt Island. A red bell buoy lies nearly ⅜ mile eastward of the eastern end of this ledge, and is the guide to the entrance to the southern channel to Port Clyde.

Unmarked **ledges** with from 12 to 18 feet of water over them lie between Old Cilley Ledge and Black Rock. They can be avoided by keeping Marshall Point Lighthouse bearing westward of **N.** ¼ **W.**

Black Rock is a bare, rocky islet with shoals surrounding it and making out from 200 to 300 yards northward and eastward. It lies 1¼ miles **S.** ½ **W.** from Marshall Point Lighthouse. There is a detached 15-foot shoal 450 yards **NE.** ¼ **E.** from Black Rock. The **N.** ¾ **W.** course leads 600 yards eastward of Black Rock and 200 yards eastward of the 15-foot shoal; the latter can be avoided by keeping Marshall Point Lighthouse bearing westward of **N.** ½ **W.**

Gunning Rock Shoal is a 4½-foot rocky shoal lying ½ mile **ENE.** ¾ **E.** from Black Rock, and about ⅜ mile **SSE.** from the westernmost of the Gunning Rocks. It can be avoided by keeping Gunning Rocks open eastward of Marshall Point Lighthouse.

An unmarked **14-foot spot** lies 300 yards **W.** of the southwestern end of Gunning Rocks; the **N.** ¾ **W** course passes about 100 yards eastward of it and 200 yards westward of Gunning Rocks. It can be avoided by keeping Marshall Point Lighthouse bearing westward of **N.** ½ **W.**

For the remaining dangers see "Dangers" under section 1, foregoing.

1 B. ***Approaching and Entering, from Westward, through Davis Straits.***—From a position about 1¼ miles *S.* of Pemaquid Lighthouse steer about **ENE.** ⅛ **E.** for Eastern Egg Rock beacon (wooden tripod, 54 feet high, upper part covered with boards).

Or, when eastward of Pemaquid Point bring Eastern Egg Rock beacon to bear between **NE.** by **E.** ¼ **E.** and **E.** and steer for it. Pass about 200 yards northwestward of the beacon and 50 yards southward of red spar buoy No. 12, then steer **E.** by **N.** for the northern end of Davis Island; pass about 200 yards northward of Seal Ledges buoy (spar, black, No. 7). Griffin Ledge buoy (spar, red, No. 8) will be sighted ahead in the middle of Davis Straits; when within 300 yards of the buoy steer nearly for it, or so as to leave it about 20 yards on the port hand, and as soon as it is passed steer **NE.** for ¼ mile; this will clear the ledges off the north end of Davis Island. Then steer **ENE.**, passing about 200 yards northward of Gig Rock buoy (spar, red and black horizontal stripes) and 100 yards north of The Sisters buoy (spar, black, No. 5). Continue this course, passing about 100 yards north of Allen Ledge buoy (spar, black, No. 3) and give Hooper Island a berth of about 200 yards. When about 500 yards beyond the buoy haul northward, enter Port Clyde in mid-channel, and proceed as directed in section 1, foregoing.

Remarks and dangers.—On the **E.** by **N.** course, after leaving Eastern Egg Rock, **Old Hump Ledge,** an irregular mass of bare rocks with green patches on top, will be seen on the port bow, and black buoy No. 7, marking Seal Ledges, a little on the starboard bow. The northern end of Davis Island is bare; the islands on the northern side of the channel are covered with a straggling growth of trees. Between Griffin Ledge buoy and Davis Island the channel is less than 100 yards wide, and it is necessary to pass close southward of the buoy.

Eastern Egg Rock is low and bare with ledges making out about 100 yards from its northern end, which is marked by a wooden tripod. It lies 5¼ miles **E.** from Pemaquid Point Lighthouse and 1⅞ miles **SSW. ¼ W.** from Franklin Island Lighthouse.

Egg Rock North Ledge, about 250 to 300 yards northward of Eastern Egg Rock, is awash at low water. It is the southernmost of a series of ledges extending to Franklin Island and is marked on its southeastern end by a buoy (spar, red, No. 12).

Seal Ledges are two rocky ledges with deep water between them, lying in a **NE.** by **N.** and **SW.** by **S.** direction and separated about ¼ mile. The northern one is bare at low water and is marked on its northern end by a buoy (spar, black, No. 7) lying 2 miles **E.** by **N.** from Eastern Egg Rock beacon. The southern one has 6 feet of water on it.

Old Hump Ledge is a bare rock with ledges, dry at low water, making out about 250 yards northeastward. It should be left from 400 to 500 yards on the port hand on the **E.** by **N.** course.

Griffin Ledge, with 10 feet of water on it, is midway in the narrow part of Davis Straits. It is marked on its southern side by a buoy (spar, red, No. 8), which should be left close-to on the port hand going east.

Davis Island has shoals making out about 150 yards northward from it; after passing red buoy No. 8 the course should be changed quickly northward so as to give the north end of Davis Island a berth of about 250 yards.

On the **ENE.** course Marshall Point Lighthouse should be a little on the starboard bow; the red and black horizontally striped buoy marking Gig Rock will be on the starboard bow and black spar buoy No. 5, marking The Sisters, and black spar buoy No. 3, on Allen Ledge, at the entrance to Port Clyde, will be nearly ahead a little on the starboard bow. The red iron spindle on Old Horse Ledge and red spar buoy No. 6 on Hooper Island Rocks will be on the port hand.

Gig Rock is a small ledge with 5 feet of water on it, lying ⅝ mile **ENE.** from the northern end of Davis Island; it is marked on its northwest end by a buoy (spar, red and black horizontal stripes).

The Sisters are two small ledges, lying 1¼ miles **SW.** by **W. ¼ W.** from Marshall Point Lighthouse; they are awash at low water. The westernmost is marked on its northwestern end by a buoy (spar, black, No. 5).

Old Horse Ledge, a rock awash at low water, lies 1⅜ miles **W.** by **S.** from Marshall Point Lighthouse. It is marked by a spindle (iron, red, 30 feet high, with cage on top).

Hooper Island Rocks is a ledge with 5¼ feet of water on it and covered with kelp, lying ⅞ mile **W. ¾ S.** from Marshall Point Lighthouse. It is marked on its southeastern side by a buoy (spar, red, No. 6). There is a detached 16-foot spot about 300 yards **NE.** from the buoy.

Hart Bar is a ledge, a part bare at low water, making out ¼ mile northward from **Hart Island**—the island **SSW. ¼ W.** from Marshall Point Lighthouse. **Allen Ledge,** with 2 feet of water over it, is off the northern end of the bar and is marked on its northern end by a buoy (spar, black, No. 3). The channel is north of this buoy.

Hooper Island has shoals making out about 150 yards from its southern end; it should not be approached closer than 200 yards on its southern or southeastern side.

MONHEGAN ISLAND AND HARBOR.*

This island lies 20 miles **WNW. ⅞ W.** from Matinicus Rock, 14½ miles **SW. ⅝ W.** from Whitehead, and 19¼ miles **E. ¼ S.** from Seguin. Monhegan Island is the westernmost of the islands lying off the entrance to Penobscot Bay, and is one of the important landmarks for vessels bound along the coast; it is about 1⅝ miles long in a **NE.** and **SW.** direction, is about 160 feet high at its highest point, and presents a rocky shore, with high bluffs in several places. Near its middle is **Monhegan Island Lighthouse** (see table, page 18), and westward is **Manana Island,** small and 100 feet high, on which is a fog signal station (see table, page 18).

Monhegan Harbor is a small anchorage, exposed southward, lying between Monhegan and Manana islands; it is used principally by fishermen and small vessels, and has 3 to 5¼ fathoms of water, with good holding ground, but there is not room at the anchorage for a moderate-sized vessel to swing. The harbor is entered from southward; a bar and two small, rocky islets obstruct the northern entrance. On the eastern side of the harbor is a small village. The nearest post-office is Port Clyde; the nearest telegraphs are at Tennant Harbor and Boothbay.

Pilots.—Vessels bound to Penobscot Bay and river or to Thomaston sometimes take a pilot from Monhegan, lying off and on outside the harbor with signal flying until boarded.

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*Shown on charts **105,** scale $\frac{1}{80,000}$, price $0.50; **312, 313,** scale $\frac{1}{40,000}$, price of each $0.25.

ST. GEORGE RIVER AND THOMASTON.*

The entrance of this river lies about 9 miles southwestward of Whitehead and **NNE.** from Monhegan; Marshall Point Lighthouse marks the eastern and Franklin Island Lighthouse the western approach (see table of lights, page 18). A group of islands, known as the **George Islands**, extends in a **SSW.** direction for 5 miles from the middle of the entrance, which is also obstructed by numerous ledges and rocks, the most prominent of which are marked by buoys or spindles. Several channels with deep water lead into the river between these islands and ledges; strangers usually take a pilot when entering. The St. George River extends 10 miles in a northeasterly direction to the town of **Thomaston**, where the Warren River, a shallow stream of no commercial importance, empties into it from northwestward. Port Clyde is on the eastern side of the entrance to the river (see page 133).

Deep Cove, on the eastern shore just north of the northern entrance to Port Clyde, has good anchorage in 3 to 5 fathoms, soft bottom.

Gay Cove is a shallow cove in the eastern shore of **Gay Island**, the western point at entrance to the river.

Pleasant Point Gut separates Gay Island from the mainland. It is unsafe for strangers.

Turkey Cove, on the eastern shore, about 1½ miles above Caldwell Island, has good anchorage in 3½ to 5 fathoms, soft bottom, about midway between the points at entrance.

Maple Juice Cove is a long, shallow cove on the west shore about 2¼ miles above Caldwell Island; good anchorage is found at the entrance, in 4 fathoms water, **SW.** from Bird Point.

Otis Cove is a broad cove, shallow at its head, on the eastern shore, about 1 mile above Maple Juice Cove. The village of **St. George** is at its head.

Broad Cove is a large, shallow cove on the western shore about 4½ miles above Caldwell Island; the village of **Cushing** is situated near its western shore.

Watts Cove and **Cutlers Cove** are two shallow coves on the eastern shore opposite Broad Cove.

The town of **Thomaston** is at the head of the St. George River. Vessels of 20 feet draft have been taken up at high water, the average draft of vessels entering here is 10 to 12 feet. There are two shipyards where wooden vessels are built.

Warren River empties into the St. George River west of Thomaston; it is navigable at high water to the village of **Warren**, about 4 miles above Thomaston. There are three drawbridges above Thomaston, with draws estimated to be 40 feet wide.

Channel.—There is a channel in St. George River up to Broad Cove which has 10 fathoms or more water; above this the depth gradually decreases and it narrows to a small stream through extensive flats which show bare at low water. There is a depth of 19 feet in the channel up to 1 mile from Thomaston. From this point a narrow channel, which is liable to shoal, has been dredged to a depth of 16 feet to Thomaston.

Anchorages.—Good anchorage for the deepest-draft vessels is found eastward of Caldwell Island in 6 to 8 fathoms water, soft bottom; above this vessels anchor anywhere in the channel where the depth is not too great (see Turkey Cove, Maple Juice Cove, and Otis Cove).

Pilots are generally taken by strangers bound up the river. If from eastward, they can be had at Port Clyde by making signal when off Marshall Point, or, standing in and coming to anchor north of Caldwell Island. From westward, vessels make signal when off Franklin Island and take a pilot either from Franklin or Harbor islands.

Towboats are seldom used; they may be had from Bath or Rockland by telegraph.

Supplies.—Provisions, anthracite and bituminous coal in limited quantity, and water can be had at Thomaston.

Ice closes the river to navigation from December to March.

Tides.—The mean rise and fall of the tides at Thomaston is 10 feet, and high and low water occur 25 minutes later than at Port Clyde (see table, page 27).

SAILING DIRECTIONS, ST. GEORGE RIVER TO AN ANCHORAGE EAST OF CALDWELL ISLAND.

Note.—Strangers coming from eastward usually anchor in Port Clyde, or take a pilot off Marshall Point.

1. ***Approaching and Entering, from Eastward.***—Follow the directions for Port Clyde in section 1, page 134, until Marshall Point Ledge buoy (spar, red, No. 4) bears *N.*, distant about 100 yards; then steer **WNW. ½ W.** and leave Allen Ledge buoy (spar, black, No. 3) about 30 yards on the port hand. Then steer **W.** by **S.**; leave Hooper

*See footnote on page 132.

Island Rocks buoy (spar, red, No. 6) about 200 yards on the starboard hand and round the buoy at this distance; when it is in range with Marshall Point Lighthouse, steer **N.** by **W.** ½ **W.** for the western end of Teal Island, and when the northern end of Bar Island bears *W.*, distant ¼ mile, steer **NE.** ½ **E.** about ⅞ mile. Then haul northward, leaving Channel Rock buoy (spar, red and black horizontal stripes) about 100 yards on the port hand, and anchor ¼ to ⅜ mile northward of this buoy in about 7 fathoms water, soft bottom.

Remarks.—The channel northward of Allen Ledge buoy is narrow and the buoy should not be left over 75 yards on the port hand.

On the **W.** by **S.** course the spindle on Old Horse Ledge will be a little on the starboard bow. Hooper Island Rocks buoy should not be approached closer than 150 yards.

On the **N.** by **W.** ½ **W.** course **Teal Island,** about 45 feet high at its southern end and partly wooded, will be ahead. **Bar Island** is the small island southwestward of Teal Island; off its northern end is a small islet surrounded by ledges.

On the **NE.** ½ **E.** course Hooper Point will be a very little on the starboard bow. Channel Rock buoy should be made on the port bow. After passing Channel Rock there are no dangers; the eastern shore should be given a berth of 300 yards.

Dangers.—Allen Ledge and Hooper Island Rocks are described on page 136.

Kelp Ledges extend out about 500 yards from the western shore of Hooper Island abreast of Bar Island; a small part of this ledge, nearest Hooper Island, is bare at low water; the rest has from 2 to 12 feet of water over it. The ledge is not marked but can be avoided by giving the western shore of Hooper Island a berth of 600 yards until the southern end of Teal Island bears **WNW.**

Murray Ledge is small, has 17 feet over it and lies about ¼ mile **SW.** ½ **S.** from Channel Rock buoy and about 350 yards **E.** from the eastern end of the Little Caldwell Islands. There is good water on all sides of this ledge.

Channel Rock is a small, detached ledge with 9 feet over it lying about 500 yards westward of Hooper Point. It is marked by a buoy (spar, red and black horizontal stripes) placed on the middle of the ledge.

1 A. ***Approaching and Entering, from Westward.***—When Franklin Island Lighthouse is made, distant 4 miles or more, steer for it on any bearing between **NE.** and **ENE.** Pass westward of Franklin Island, giving it a berth of 200 to 300 yards, and steer **NE.** by **E.** ⅞ **E.** Red spar buoy No. 2, marking Jenks Ledge, will be made on the starboard bow and left about 250 yards on the starboard hand, and the red and black horizontally striped spar buoy, marking Goose Rock Ledge, will be seen a little on the port bow; pass about 200 yards southward of Goose Rock Ledge buoy, midway between it and Goose Rock. Then steer **NE.** by **E.** ¾ **E.**, so as to follow the trend of the shore of Caldwell Island at a distance of 250 yards, and leave Gay Cove Ledge buoy (spar, black, No. 3) 150 yards on the port hand. Round the northern end of Caldwell Island, giving it a berth of 200 to 300 yards, and anchor anywhere eastward of the island in from 6 to 10 fathoms, good holding ground.

Remarks and dangers.—Standing for Franklin Island Lighthouse, Eastern Egg Rock and beacon should be on the starboard bow and left at least ⅝ mile on the starboard hand. New Harbor Sunken Ledges buoy (nun, red, No. 14) will be on the port bow, and should be left not nearer than ¼ mile on the port hand. **Western Egg Rock,** a bare, rocky island, with patches of grass on top, will also be seen on the port bow, and the black spar buoy, No. 1, marking the shoal eastward of the rock, should be left not closer than ¼ mile on the port hand. **Franklin Island** is comparatively bold-to, and may be approached to about 150 yards.

Moser Ledge is an unmarked 17-foot rock lying 3¾ miles **SE.** ½ **E.** from Pemaquid Point Lighthouse. It can be avoided by keeping Franklin Island Lighthouse bearing eastward of **NE.**

New Harbor Sunken Ledges are described on page 145.

Western Egg Rock has a ledge extending 300 yards **SW.** by **S.**, which terminates in a rock awash at low water. Western Egg Rock Breakers are over a shoal with 4 feet over it and lie about 700 yards eastward of Western Egg Rock; they are marked by a buoy (spar, black, No. 1).

Egg Rock South Ledge, Eastern Egg Rock, Egg Rock North Ledge, Midway Rock, Houghs Ledge, and Round Ledge are a series of rocks and ledges extending in a general **SSW.** direction for 2½ miles from Franklin Island. They are nearly all unmarked, but may be avoided by keeping Franklin Island Lighthouse bearing eastward of **NNE.** ¾ **E.**

On the **NE.** by **E.** ⅞ **E.** course beyond Franklin Island, **Gangway Ledge,** a small, bare rock, will be seen on the starboard bow and left about ¼ mile on the starboard hand. **Otter Island** well wooded and about 40 feet

high on its southern end, will be on the port bow and left about ½ mile on the port hand. Caldwell Island is comparatively bold-to on its western and northern sides, and may be approached to about 150 yards.

Gangway Ledge is a small, bare rock with shoals extending about 75 yards from it. It lies ⅞ mile **ENE. ½ E.** from Franklin Island Lighthouse.

Otter Island Ledge, with 8 feet of water on it, lies about 400 yards eastward of Otter Island, with deep water between it and the ledge.

Byer Ship Ledge, a part of which is bare at high water, extends about ⅜ mile in a general east and northeast direction from the northern end of Otter Island.

Jenks Ledge, showing bare at low water, is marked on its northern side by a buoy (spar, red, No. 2) lying 3 miles **NE.** by **E. ¾ E.** from Franklin Island Lighthouse.

Goose Rock Ledge, with 6 feet of water on it, lies about ½ mile **SSE.** from the southern end of Gay Island, and ¼ mile **NNW. ½ W.** from Goose Rock. It is marked on its southern side by a buoy (spar, red and black horizontal stripes). There is good water on both sides of the ledge, but the best passage is between it and Goose Rock.

Goose Rock is bare, and surrounded by ledges extending out about 150 yards on all sides. It lies about ⅜ mile **W. ½ N.** from the southern end of Caldwell Island.

Gay Cove Ledge, with 6 feet of water on it, is marked on its eastern side by a buoy (spar, black, No. 3) lying about 600 yards **NW. ¼ N.** from the northern end of Caldwell Island. There is good water westward of this buoy, by giving it a berth of over 200 yards, but northeastward of the ledge shoals make off 350 yards from Gay Island.

MUSCONGUS BAY.*

This bay is about 12 miles westward of Whitehead, and lies between the Georges Islands on the east and Pemaquid Neck on the west; it is obstructed by numerous islands and ledges; many of the latter are marked by buoys. Muscongus Bay and the adjacent waters are seldom used by vessels seeking shelter in heavy weather. Tennant Harbor and Port Clyde eastward, and Boothbay Harbor westward, are much easier of access, and afford better anchorage. Monhegan Lighthouse is south of Muscongus Bay, and is the offshore guide to it. **Franklin Island Lighthouse** (see table, page 18) is in the middle of the bay, and a guide for vessels entering. **Pemaquid Lighthouse** (see table, page 18) is on the western point at the entrance. Vessels bound to Port Clyde or St. George River from westward usually pass through the bay, the former passing north of Eastern Egg Rock and through Davis Straits, and the latter north of Franklin Island. Strangers navigating these waters generally take a pilot, and if bound up the Meduncook or Medomak rivers should always take one, on account of the numerous unmarked dangers and strong variable tidal currents.

New Harbor is a small, narrow cove on the western shore of Muscongus Bay, about 2¼ miles northeastward of Pemaquid Point; it is used by fishermen, and has a very limited anchorage; although open eastward, it is well sheltered from the sea. Strangers should not attempt to enter without a pilot. Ice seldom forms in the harbor, but it is sometimes closed by drift ice from the bay.

Meduncook River, Friendship Harbor, Medomak River, and Muscongus Sound are described under their several headings.

Pilots for these waters can be found in Tennant Harbor or Port Clyde if coming from eastward, and in Boothbay Harbor or New Harbor if coming from westward.

Tides.—The mean rise and fall of tides in the bay is about 9½ feet.

SAILING DIRECTIONS, THROUGH DAVIS STRAITS FROM EASTWARD.

The least water, about 3½ fathoms, will be found south of Marshall Point Lighthouse. The flood tide has a tendency to set a vessel northward and the ebb southward on the sailing lines westward of Port Clyde. For directions for passing through Davis Straits from westward see section 1 B, page 135.

1. Follow the directions in section 1, page 134, and when Marshall Ledge buoy (spar, red, No. 4) bears *N.*, distant 100 yards, steer about **WNW. ½ W.** and pass about 30 yards north of Allen Ledge buoy (spar, black, No. 3). When this buoy is abaft the beam steer **WSW.**, heading for the opening north of Davis Island. Hooper Island Rocks buoy (spar, red, No. 6) and Old Horse Ledge spindle (iron, red, with cage on

*Shown on charts **105**, scale $\frac{1}{80,000}$, price, $0.50; **313**, scale $\frac{1}{40,000}$, price, $0.25.

top) should be left on the starboard hand, and The Sisters buoy (spar, black, No. 5) and Gig Rock buoy (spar, red and black horizontal stripes) should be left on the port hand; Griffin Ledge buoy (spar, red, No. 8) should be made ahead. Pass about 250 yards north of Davis Island, and then haul more southward and leave red spar buoy No. 8 about 20 yards on the starboard hand. When about 200 yards southwestward of this buoy steer **W.** by **S.**, heading so as to pass northward of Eastern Egg Rock beacon. Seal Ledges buoy (spar, black, No. 7) should be left on the port hand, and Old Hump Ledge on the starboard hand. Pass about 200 yards north of Eastern Egg Rock beacon, leaving Egg Rock North Ledge buoy (spar, red, No. 12) about 50 yards on the starboard hand. Then—

Bound to Friendship, or into the Medomak River.—Follow the directions in section 1, page 141 or 142.

Bound to Muscongus Sound.—Follow the directions in section 1, page 143.

Bound to the Damariscotta River or to Boothbay Harbor.—Continue the **W.** by **S.** course and pass about 1 mile south of Pemaquid Point. Leave Pemaquid Ledge buoy (can, red and black horizontal stripes) ¼ mile on the starboard hand, and when Ram Island Lighthouse bears **W.** ⅝ **N.**, follow the directions in section 1, "Sailing Directions, Damariscotta River," or section 1, "Sailing Directions, Boothbay Harbor."

See "Remarks and dangers," page 136.

MEDUNCOOK RIVER*

is an unimportant estuary making in a general northeast direction, just westward of St. George River; the entrance forms an approach to Friendship Harbor and is a good anchorage with 3¾ to 5 fathoms water. The approaches to the entrance are the same as for St. George River and the anchorage is marked by two buoys. The river above the anchorage has a narrow, crooked channel, and is obstructed by numerous unmarked rocks and ledges so that local knowledge is necessary for its navigation.

SAILING DIRECTIONS, MEDUNCOOK RIVER.

1. ***Entering, from Eastward.***—Follow the directions in section 1, "Sailing Directions, St. George River to an Anchorage East of Caldwell Island," page 137, and when Channel Rock buoy (spar, red and black horizontal stripes) bears *SW.*, distant 100 yards, steer **NW.** ½ **N.** Round the north end of Caldwell Island, at a distance of 250 yards, leaving Gay Cove Ledge buoy (spar, black, No. 3) 150 yards on the starboard hand, and steer **SW.** by **W.** ¾ **W.** so as to pass midway between Goose Rock and Goose Rock Ledge buoy (spar, red and black horizontal stripes). When Goose Rock Ledge buoy is 400 yards abaft the beam, steer about **NNW.** ¼ **W.**; leave a black spar buoy about 300 yards on the starboard hand, and look out for a red spar buoy which should be seen on the starboard bow. Haul up for this buoy and leave it 60 yards on the starboard hand, and steer **NE.** by **E.** between Gay Island and Morse Island. Having stood on this course nearly ¾ mile, leave black spar buoy No. 1 about 50 yards on the port hand and haul northward. Anchor ¼ mile north of this buoy in 5 fathoms, soft bottom.

Remarks and dangers.—The directions, if closely followed, will lead clear of all dangers; the buoys are the only aids that a stranger can depend on recognizing. The southeast shore of Morse Island can be approached as close as 75 yards, but **Northeast Point Reef** makes northeastward from the island ⅛ mile; black spar buoy No. 1 is on the end of the reef. The anchorage north of this buoy has a diameter of about ⅛ mile.

Gay Cove Ledge and **Goose Rock Ledge** are described on page 139.

1 A. ***Entering, from Westward.***—Follow the directions in section 1 A, "Sailing Directions, St. George River to an Anchorage East of Caldwell Island," and when Jenks Ledge buoy (spar, red, No. 2) is abeam, distant 250 yards, steer **N.** by **E.** ¼ **E.** for the highest part of Morse Island. When nearly up to the island, leave the red spar

* See footnote on page 139.

buoy 60 yards on the starboard hand, and steer **NE.** by **E.**; then follow the directions in section 1, preceding, to the anchorage.

Remarks and dangers.—**Byer Ship Ledge**, which makes ⅝ mile eastward from the northern end of Otter Island, should be left nearly ⅝ mile on the port hand when on the **N.** by **E.** ¼ **E.** course. See also the remarks under section 1, preceding.

FRIENDSHIP HARBOR*

lies west of Meduncook River, and is separated from it by Friendship and Garrison islands, between which a channel leads from the anchorage in Meduncook River into the harbor. The harbor extends in an **ENE.** and **WSW.** direction about 1 mile, and has good anchorage in 3¼ to 5 fathoms of water; it is little used except by local fishermen. Strangers generally take a pilot. The town of **Friendship** is on the north shore of the harbor; the usual draft of vessels loading here is 10 feet. Ice closes the harbor proper from December to March.

Hatchet Cove is a shallow cove making northward at the western end of Friendship Harbor. A narrow channel, with a least depth of 15 feet, leads northeastward into the cove near the western point at its entrance. It is of no importance as an anchorage.

SAILING DIRECTIONS, FRIENDSHIP HARBOR.

Coming from eastward one of the routes followed is through Port Clyde, across the entrance to St. George River and through the passage, northeastward of Friendship Island, joining Meduncook River with Friendship Harbor. This route is so narrow in places, and obstructed by unmarked dangers, that a pilot is necessary; strangers not wishing to take one can avoid doing so by following the sailing directions given in section 1, following.

1. ***Approaching and Entering, from Eastward.***—Follow the directions in section 1, page 139, and when about 400 yards westward of the beacon on Eastern Egg Rock, steer **N.** ½ **E.** for the eastern end of Wreck Island. When ½ to ¼ mile from the island, and the south end of Harbor Island bears about *ESE.*, steer **NE.** ¼ **N.**; leave Wreck Island from 300 to 600 yards on the port hand, and pass about midway between Black Island and Jones Garden Island, leaving Garden Island South Ledge buoy well on the port hand. When Gull Rock, small and bare, bears *W.* ½ *N.*, distant about ½ mile, change course to **ENE.** ¼ **E.**, keeping about midway between the north and south shores of Friendship Harbor. Anchor in 3 to 5 fathoms water southeastward of Jameson Point.

Remarks.—On the **N.** ¼ **E.** course **Wreck Island**—about 25 feet high, and well wooded with pine and oak, lying 1¼ miles **NW.** by **N.** from Franklin Island Lighthouse—will be ahead, and **Crane** and **Harbor islands**, low with scattered trees, will be on the starboard bow and be left on the starboard hand.

On the **NE.** ¼ **N.** course **Black Island**, about 30 feet high, and wooded with a growth of stunted spruce, will be on the starboard bow, and left about ¼ mile on the starboard hand. **Wreck Island Ledges**, two bare, rocky islets northeastward of Wreck Island, and **Jones Garden Island**, bare, rocky isle, will all be on the port bow and left ¼ to ⅝ mile on the port hand. **Gull Rock**, a small, bare, rocky islet, will be on the port bow.

Dangers.—**Devils Back**, a detached rock bare at three-quarters ebb, lies 1¼ miles **NW.** by **W.** ½ **W.** from Franklin Island Lighthouse. The **N.** ¼ **E.** course leads about 600 yards eastward of this danger.

Harbor Island Rock, with 10 feet of water on it, is a dangerous, unmarked ledge, lying midway between the southern end of Harbor Island and Wreck Island, and 600 yards **SW.** by **W.** ½ **W.** from the extreme western end of Harbor Island.

Wreck Island Ledges are two bare islets surrounded by shoals, extending about ¼ mile in a **NE.** and **SW.** direction, about ¼ mile **NE.** of Wreck Island; they may be approached to about 150 yards.

Garden Island South Ledge, with 2 feet of water on it, makes out 400 yards **SW.** by **S.** from Jones Garden Island. It is marked on its southern end by a buoy (spar, red, No. 2).

Jones Garden Island has ledges making out 250 yards northeastward from it, and should not be approached closer than 300 yards on its northern or eastern side.

An unmarked **12-foot ledge** makes out ¼ mile in a **NNW.** direction from the southwestern end of Cranberry Island. It can be avoided by keeping the southwestern end of Friendship Island bearing eastward of **NE.** ¼ **E.** after Jones Garden Island bears abaft the port beam.

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*See footnote on page 139.

1 A. *From Southward or Westward.*—When Franklin Island Lighthouse is made, distant 4 miles or more, steer for it on any bearing between **NE.** and **ENE.**, and when about 1 mile distant from the lighthouse, and the eastern side of Wreck Island bears **N.** ½ **E.**, steer for the latter on that bearing, and follow the directions given in section 1, foregoing.

See "Remarks and dangers," when standing for Franklin Island Lighthouse, under section 1 A, page 138. There is a passage leading between Western Egg Rock and Haddock Island, and Jones Garden Island and Thief Island, but it is so obstructed by unmarked dangers that strangers are advised not to attempt it.

MEDOMAK RIVER*

enters the head of Muscongus Bay westward of **Martins Point**, the western point at the entrance to Friendship Harbor. Strangers wishing to enter the river should take a pilot, on account of the many unmarked dangers, narrow and crooked channels, and strong tidal currents, which require local knowledge. The lower part of the river is about 2 miles wide, but is separated by several islands into two approaches. which have three narrow and crooked channels by which the river proper is entered. The approaches to these channels are through Muscongus Bay or Muscongus Sound. The eastern approach is ⅝ mile wide and comparatively clear of dangers; at its upper end are two passages leading into the river, one through **Back River Cove**, and the other **Flying Passage**. Both have good water, but are very narrow in places, with strong tidal currents. **Hockomock Channel**, the western entrance, has a least depth of 4½ fathoms, but is narrow in places and has strong tidal currents.

Waldoboro, about 9 miles above Martins Point, is at the head of navigation, and is on a branch of the Maine Central Railroad. There is a least depth of 1 foot in the river about ¼ mile below the town. The upper part of the river channel is staked with poles during the summer. The usual draft of vessels entering at high water is 10 feet; there is 3 feet at low water alongside the wharves; 12 feet can be taken up at low water to within 3 miles of the town. Fresh water is taken from the river just above the wharves, and provisions can be obtained in the town. **Ice** closes the river to navigation from December to April. There is a shipyard and ordinary repairs to vessels can be made; there is no marine railway.

Marine Hospital.—Emergency relief is furnished by the United States Public Health and Marine-Hospital Service as for stations of Class IV (see Appendix IV).

SAILING DIRECTIONS, MEDOMAK RIVER.

1. *Approaching and to the Entrance, from Eastward.*—*I. From Davis Straits.*—Having come from Port Clyde and through Davis Straits as directed in section 1, page 139 when about 400 yards westward of Eastern Egg Rock beacon, steer **N.** ½ **E.** for the eastern end of Wreck Island. When the island is about ⅝ mile distant ahead, and the south end of Harbor Island bears about *ESE.*, steer **NE.** ¼ **N.** about 1½ miles until midway between Black Island and Jones Garden Island. From this position steer **N.** by **E.** ¾ **E.** for the entrance of the river, leaving Gull Rock a little over ¼ mile on the starboard hand. Anchor about 1¾ miles above Gull Rock and ⅜ mile southwestward of Hungry Island. If desiring to enter the river, or if bound to Waldoboro, take a pilot.

Remarks and dangers from Eastern Egg Rock to Jones Garden Island are given under section 1, page 141.

The **N.** by **E.** ¾ **E.** course leads up the middle of the entrance to the river, and Hungry Island will be ahead. All dangers above Gull Rock will be avoided by giving the shores a berth of 400 yards when on this course, and coming to anchor a little westward of mid-channel below Hungry Island. **Gull Rock**, small and bare, lies ¼ mile southwestward from Martins Point, the eastern point of the approach to Medomak River; it should be given a berth of at least 225 yards.

II. From Southward of Allen Island.—Being about 1¾ miles south of Allen Island, and about 3 miles northward of Monhegan, steer **NW.** by **W.** ½ **W.**, passing at least ½ mile south of Shark Island. When Franklin Island Lighthouse bears *NE.* by *N.* steer **N.** by **E.** ¾ **E.** about 3 miles, and when Wreck Island is about 1 mile distant its eastern end should bear **N.** ½ **E.**; then steer for the eastern end of Wreck Island on this bearing and follow the directions in paragraph I, preceding.

*See footnote on page 139.

Remarks and dangers.—On the **NW.** by **W.** ¼ **W.** course Shark Island should be left ¼ mile or more on the starboard hand, and Eastern Egg Rock beacon should bear **NE.**, distant 1½ miles, when changing course to **N.** by **E.** ¾ **E.**

Old Man Ledge, marked by a spindle, lies nearly 1 mile south of Allen Island, and a 12-foot spot and **Old Woman Ledge,** bare at half tide, lie between them.

Detached rocks and **unmarked ledges** extend 3 miles westward from Allen Island. **Shark Island,** the southernmost, is low and rocky with ledges extending ¼ mile northwestward; it lies 1¾ miles **W.** ¼ **S.** from the southern end of Allen Island.

The **N.** by **E.** ¾ **E.** course leads about ⅝ mile westward of Eastern Egg Rock beacon, and ¼ mile eastward of Western Egg Rock Breakers buoy (spar, black, No. 1); **Wreck Island,** small and wooded, and lying about 1½ miles **NW.** by **N.** from Franklin Island Lighthouse, will be seen on the port bow. The lighthouse should be about ⅞ mile distant on the starboard beam when changing course for Wreck Island.

South Ledge, with 19 feet over it, lies nearly ¾ mile **SSW.** from Eastern Egg Rock beacon. **Egg Rock South Ledge,** with 8 feet on it, lies between this ledge and Eastern Egg Rock.

Western Egg Rock Breakers have 4 feet over them and lie 700 yards eastward of Western Egg Rock. It is marked by a buoy (spar, black, No. 1).

1 A. ***Approaching and to the Entrance, from Westward.***—Follow the directions in section 1 A, page 142, and when the eastern end of Wreck Island bears **N.** ½ **E.**, steer for it on that bearing and follow the directions in paragraph I of section 1, preceding.

For remarks and dangers see section 1A, page 138.

MUSCONGUS SOUND*

is on the western side of Muscongus Bay, between Muscongus and Hog islands on the east and the mainland on the west; it is about ⅝ mile wide and 5 miles long in a **NNE.** and **SSW.** direction, and has several rocks and ledges near its southern entrance, the most prominent of which are marked by buoys. North of Hog Island a narrow channel called **Lower Narrows** forms one of the approaches to Hockomock Channel and Medomak River. Many of the vessels bound up the Medomak River pass through Muscongus Sound; strangers should take a pilot either at New Harbor or at Round Pond.

Marsh Harbor is on the southeastern side of Muscongus Island, between it and Marsh Island; it is not an anchorage.

Round Pond is a landlocked little harbor with 12 to 18 feet of water in its middle, on the west shore of Muscongus Sound, about 2 miles above the southern end of Muscongus Island; it affords good anchorage for small vessels, but is little used. There is a granite quarry and wharf on the north side of the entrance at which vessels load granite, and **Round Pond,** a village, is at the head of the harbor.

Muscongus Bar is the shoal between the north end of Muscongus Island and the south end of Hog Island; it has 5 feet at low water, but strangers should avoid it.

Muscongus Harbor is a small cove and village on the west shore of the sound about 1½ miles above Round Pond.

Greenland Cove is the extreme northern end of the sound; it is shallow and of no importance.

SAILING DIRECTIONS, MUSCONGUS SOUND TO AN ANCHORAGE IN ROUND POND HARBOR.

1. ***Approaching and Entering, from Eastward.***—Having come through Davis Straits as directed in section 1, page 139, when Eastern Egg Rock beacon bears *S.*, distant 200 yards, steer **NW.** by **W.** ¼ **W.** Pass 400 yards southward of Haddock Island Kelp Ledge buoy (spar, red and black horizontal stripes), and when it bears *NE.*, or Pemaquid Lighthouse bears *SW.* by *W.* ¾ *W.*, steer **N.** by **W.** ½ **W.** Pass about 300 yards southwestward of Webbers Sunken Ledge buoy (spar, red, No. 2), and when about 400 yards from the western shore and southwestward of Browns Head Ledge buoy, steer **NE.** by **N.**, giving Browns Head a berth of about 300 yards.

Pass about 100 to 200 yards eastward of Poland South Ledge buoy (spar, black, No. 1) and steer **N.** by **E.**, giving Poland North Ledge buoy (spar, black, No. 3) a berth of about

*See footnote on page 139.

300 yards. When the harbor is opened, pass close northward of Harbor Ledge buoy (spar, black, No. 5) on a **W.** course and stand into Round Pond Harbor, keeping about midway between the shores at its entrance; anchor in the middle of the harbor in 12 to 18 feet of water.

If bound into Medomak River take a pilot off the entrance to Round Pond Harbor.

Remarks and dangers.—On the **NW.** by **W.** ¼ **W.** course, after leaving Eastern Egg Rock, **Western Egg Rock,** a bare, rocky islet, and the black spar buoy marking the breakers eastward of it, will be made on the starboard bow; the rock should be left about ⅝ mile on the starboard hand. The horizontally striped buoy marking Haddock Island Kelp Ledge will be seen on the starboard bow, and left about 400 yards on the starboard hand. The large red nun buoy marking the southern end of New Harbor Sunken Ledges will be broad off the port bow and left about 1½ miles on the port hand.

Western Egg Rock has a ledge making out about 400 yards in a southwesterly direction from its southern end

New Harbor Sunken Ledges are described under section 1 A, following. The north end of the ledge is left at least ½ mile on the port hand when on the **NW.** by **W.** ¼ **W.** course.

Haddock Island Kelp Ledge, with 8 feet of water on it, lies ⅞ mile **WNW.** ½ **W.** from the southern end of Western Egg Rock; it is marked on its southern end by a buoy (spar, red and black horizontal stripes).

On the **N.** by **W.** ½ **W.** course **Haddock Island,** low and rocky, covered with a stunted growth of spruce, will be left about ⅝ mile on the starboard hand. Red spar buoy No. 2, marking Webbers Sunken Ledge, will be left about 300 yards on the starboard hand. The high hill back of Browns Head will show prominently a little on the starboard bow. **Browns Head** is rocky, with a marked gap at the water line showing southeastward.

Webbers Sunken Ledge, with 7 feet of water on it, lies abut ⅝ mile **NW.** ½ **N.** from the southern end of Haddock Island; it is marked on its southern end by a buoy (spar, red, No. 2).

Browns Head Ledge, small, with 13 feet over it, lies ⅝ mile **S.** by **E.** ½ **E.** from Browns Head, and is marked on its southern end by a buoy (spar, red and black horizontal stripes).

On the **NE.** by **N.** course up Muscongus Sound, red spar buoy No. 4, marking Bar Island Ledge, will show on the starboard bow and be left about ⅝ mile on the starboard hand. From ¼ mile northward of Bar Island Ledge buoy to the Poland Ledges there are no dangers; the eastern shore of the sound may be approached as close as 250 yards, except opposite the entrance to Round Pond, where shoals make out about ¼ mile from the shore.

Webbers Dry Ledge, bare at quarter ebb; **Webbers North Ledge,** with 14 feet of water on it, and **Bar Island Rock,** with 11 feet of water on it, are unmarked dangers lying in the entrance to Muscongus Sound. They can be avoided by keeping within 600 yards of the western shore.

Bar Island Ledge, with a rock bare at low water, is about ¼ mile long in a general **NNE.** and **SSW.** direction and lies 600 yards **WNW.** ¼ **W.** from **Bar Island,** the small island south of and close to Muscongus Island; it is marked on its southern end by a buoy (spar, red, No. 4).

Poland South Ledge, with 9 feet of water on it, is marked on its eastern side by a buoy (spar, black, No. 1) lying near the middle of the sound and 1 mile north of the southern end of Muscongus Island. The best water is eastward of it.

Poland North Ledge, bare at low water, makes out 300 yards from the western shore and lies about ⅝ mile **S.** of the southeastern point at the entrance to Round Pond Harbor. There is no safe passage, for a stranger, between this ledge and the shore. It is marked on its southern end by a buoy (spar, black, No. 3).

Harbor Ledge extends 300 yards in a **N.** by **E.** direction from the southeastern point at the entrance to Round Pond Harbor. It is marked on its northern end by a buoy (spar, black, No. 5) placed in 18 feet water. The channel leads close northward of this buoy; there is an 18-foot spot about 100 yards northeastward of it.

1 A. ***From Southward or Westward.***—After passing Pemaquid Point Lighthouse follow the western shore on a general **NE.** by **N.** course, keeping about ¾ mile from Pemaquid Neck until abreast Long Cove, when haul in to about 500 yards from the western shore; steer **NE.** by **N.** and follow the directions in section 1, foregoing.

Remarks.—Approaching Pemaquid Neck the large red nun buoy marking New Harbor Sunken Ledges may be seen on the starboard bow and should be left well on the starboard hand. Standing along Pemaquid Neck, **New Harbor Dry Ledge,** two little islets about ½ mile south of New Harbor, and **Little Island,** about ¼ mile south of New Harbor, will be made on the port bow and left ¼ to ½ mile on the port hand. Above Little Island, New Harbor, marked by red spar buoy and spindle, will be opened out. About ⅝ mile eastward of New Harbor is a black bell buoy, and ½ mile northward of New Harbor **Long Cove** makes in a **NNE.** direction into Pemaquid Neck. The western shore from Long Cove to Round Pond is bold-to and may be approached to about 100 yards except for a short distance west of Poland North Ledge. A stranger should always pass eastward of the Poland Ledges.

Dangers.—**Moser Ledge** is an unmarked 17-foot rock lying 3¾ miles **SE.** ½ **E.** from Pemaquid Point Lighthouse. It can be avoided by keeping Franklin Island Lighthouse bearing eastward of **NE.**

Pumpkin Cove Ledge, with 3¼ fathoms on it, lies 1 mile **ENE.** from Pemaquid Point Lighthouse and about ½ mile from the shore. The sea breaks on it in heavy weather.

New Harbor Sunken Ledges are a number of dangerous ledges, with 4 to 15 feet of water on them, extending about ½ mile in a general **NE.** by **N.** and **SW.** by **S.** direction. They lie about 3 miles **ENE.** ¾ **E.** from Pemaquid Point Lighthouse, and are marked on their southern end by a buoy (nun, red, No. 14).

New Harbor Dry Ledges, with a bare islet at each end, are about ¼ mile long in a **NNE.** and **SSW.** direction, about ⅜ mile from the western shore and 1¾ miles northward of Pemaquid Point Lighthouse. There is no safe passage between these ledges and the western shore.

Little Island, a bare ledge, lies about 200 yards from the western shore, about ¼ mile south of New Harbor. It is the center of a ledge which is about ¼ mile long in a general **NE.** by **N.** and **SW.** by **S.** direction. There is a narrow passage about midway between the island and mainland.

Salt Pond Ledge, a rock with 13 feet of water on it, lies off the northern side of the entrance to New Harbor and is marked by a black bell buoy placed 400 yards southeastward from the rock.

The remaining dangers at the entrance and in Muscongus Sound are described under section 1, foregoing.

JOHNS BAY.*

This bay lies just westward of Pemaquid Neck, between it and Rutherfords Island. It is about 1¼ miles wide at its entrance and 2 miles long to Johns Island, above which the Pemaquid River empties into its northeastern end, and Johns River into its northwestern. The bay is free from dangers, and has deep water up to Johns Island, above which there are several ledges and rocks on the western side of the entrance to Johns River, and also off the entrance to Pemaquid River.

The bay is of no commercial importance; a number of summer resorts are located on its shores, and it is only used as an anchorage by fishermen and yachts well acquainted with the locality; the holding ground is poor, except in a few places near the head of the bay and in the coves.

Pemaquid Harbor is at the entrance to Pemaquid River, northeastward of Johns Island; it is entered by several narrow channels between islands and rocks; a post village is situated on the north side of the harbor. **Pemaquid River** extends northeastward about 2 miles to the village of **Pemaquid Falls.** The river is dry at low water near its head, and has a narrow and very crooked channel. Only small vessels, well acquainted with the locality, enter Pemaquid Harbor and River.

McFarlings Cove is in the northwestern side of the bay near the entrance of Johns River; a steep hill about 150 feet high is on the western shore of the cove. **Johns River** extends northward about 2 miles above McFarlings Cove, and separates into two branches, the eastern, **Fosters Cove;** the western, **Western Branch. Robinsons Cove** makes into the western shore of Johns River, about 1 mile above the entrance. A stranger is advised not to enter the bay for an anchorage unless obliged to. Port Clyde, eastward, and Boothbay Harbor, westward, are preferable at all times.

GENERAL DIRECTIONS, JOHNS BAY TO PEMAQUID HARBOR OR McFARLINGS COVE.

When off the entrance to Johns Bay, take care to avoid Pemaquid Ledge which lies 1¼ miles *SW.* from Pemaquid Point Lighthouse, and is marked by a red and black horizontally striped can buoy. Stand up the middle of the bay on a **N.** by **E.** course with Johns Island ahead. When Johns Island is ½ mile distant ahead steer **N.** ¼ **W.** so as to leave the western shore of the island 200 yards on the starboard hand, and continue this course until the southern end of *Beaver Island* (the small island 300 yards north of Johns Island) bears *ESE.* ¼ *E.*; then—

Bound into McFarlings Cove.—Steer **WNW.** ¼ **W.** keeping the south end of the island bearing *ESE.* ¼ *E.* and so as to pass 225 yards north of the north end of Davis Island; when about 300 yards from shore haul southward and anchor in 3½ fathoms water with the north end of Davis Island bearing about *E.*

Bound into Pemaquid Harbor.—Steer **E.** so as to pass 125 yards north of Beaver Island, and when eastward of the island steer about **E.** ½ **S.** and anchor in the middle of the harbor in 6 to 7 fathoms water.

Remarks.—The above directions must be closely followed to avoid the ledges lying north of Beaver Island and north and east of Davis Island.

* See footnote on page 139.

DAMARISCOTTA RIVER.*

The entrance to this river is about 3 miles westward of Pemaquid Point and 1 mile northeastward from Ram Island; it bears **NW.** by **W.**, distant 11¼ miles from Monhegan Island. Ram Island Lighthouse is a guide to the entrance. From its mouth the river trends in a general **NNE.** direction for 14 miles to the towns of Damariscotta and Newcastle, at the head of navigation. It is navigable to these towns for vessels of 18 feet draft at high water, but the tidal currents are strong, and, although some of the dangers are marked by buoys, strangers should not pass above East Boothbay without a pilot.

The channel of the river is crooked, and in many places, owing to islands and ledges, very narrow; for a distance of 11 miles above the mouth of the river a least depth of 5 fathoms may be carried in the channel; above this the water shoals gradually to 9 feet at low water, just below the town of Damariscotta.

Inner Heron Island, on the eastern side of the main entrance, is ¼ mile long in a **N.** and **S.** direction, and 300 yards wide. It has ledges extending southward and southwestward from it. There are several large summer houses on it and a landing at its northern end.

Christmas Cove is a small cove on the eastern side of the entrance, lying about ⅝ mile **NNE.** from the northern end of Inner Heron Island. It has anchorage for small vessels in 9 to 19 feet of water, but it is seldom used except by local fishermen and small yachts. The village of **South Bristol** is on its western shore.

East Boothbay is a village on the west bank of the river, about 3 miles above its mouth; vessels bound up the river and waiting for a favorable wind or tide usually anchor here, and strangers take a pilot if one has not been taken off the entrance.

The **Narrows**, about 1⅝ miles above East Boothbay, is formed by Fort Island, which contracts the channel to a width of about 150 yards.

Clarks Cove is in the eastern shore of the river where it makes an abrupt bend westward about 2¼ miles above the Narrows.

Pleasant Cove is on the western shore of the river opposite Clarks Cove, and makes in nearly 1¼ miles southwestward; there is good anchorage in the mouth of this cove just westward of Carlisle Point, in 2½ to 5 fathoms, soft bottom.

Damariscotta on the east bank, and **Newcastle** on the west bank of the river, 14 miles from its mouth, are connected by a bridge; they are on a branch of the Maine Central Railroad. Vessels of 18 feet draft can go to the wharves at either place at high water; the usual draft of vessels loading here is 10 feet; there is 8 to 10 feet of water alongside the wharves.

Anchorages.—The entrance of Christmas Cove affords anchorage in 30 feet water, but is not much used, vessels bound into the river usually going as far as Meadow Cove, just above East Boothbay, on the west bank, where there is good anchorage in 20 to 40 feet water, keeping 150 yards from the shore; this is as far as a stranger should attempt to go without a pilot. Above Pleasant Cove vessels can anchor anywhere in the channel where the bottom and depth of water are suitable.

Pilots can be found at Boothbay and at East Boothbay. A stranger should take a pilot on account of the tidal currents, which have considerable velocity; it requires some local knowledge to pass through and above the Narrows.

Towboats.—Large vessels generally take a towboat, telegraphing to Bath for one while anchored in Boothbay or in the river. The vessels ordinarily loading here sail up the river with a favorable wind and tide.

Supplies.—Provisions can be found at East Boothbay, Damariscotta, and Newcastle. Water can be had at East Boothbay.

Ice closes the river for a distance of 8 miles below Damariscotta during January, February, and March.

Currents.—The tidal currents have considerable velocity; the ebb lasts about two hours after low water in the upper part of the river and is usually stronger than the flood. The currents follow the general direction of the channel.

Tides.—It is high water at Newcastle about 30 minutes later than at the mouth of the river. See also table on page 27.

SAILING DIRECTIONS, DAMARISCOTTA RIVER TO AN ANCHORAGE OFF EAST BOOTHBAY.

1. ***Approaching and Entering, from Eastward.***—*From a position ½ mile S. from Old Man Ledge spindle*, steer **W. ⅝ N.** Ram Island Lighthouse will be made ahead; steer for the lighthouse until the south end of Thrumbcap Island bears *N.*, distant ⅝ mile.

*See footnote on page 139.

From a position ½ mile N. from the whistling buoy north of Monhegan Island, steer **NW.** by **W.** ¾ **W.** until Ram Island Lighthouse bears *W.* ⅝ *N.* and the south end of Thrumbcap Island bears *N.*, distant ⅜ mile.

From a position 1½ miles SW. from Monhegan Island Lighthouse, steer **NW.** ½ **W.** until Ram Island Lighthouse bears *W.* ⅝ *N.*, and the south end of Thrumbcap Island bears *N.*, distant ⅜ mile.

When Ram Island Lighthouse bears *W.* ⅝ *N.*, and the south end of Thrumbcap Island bears *N.* distant ⅜ mile, steer **NW.** ¼ **W.** and pass about 400 yards southwestward of Inner Heron Island Ledge buoy (spar, red, No. 2); when Ram Island Lighthouse bears *SW.* by *W.* ¾ *W.* and Inner Heron Island Ledge buoy is abaft the starboard beam, change course to **N.** by **E.** ⅛ **E.**, and head midway between Rutherfords Island and Linekins Neck. Pass westward of East Shore buoy (spar, red, No. 6); give Farnums Point a berth of 300 yards, and when it is abeam change course to **N.** by **W.** ½ **W.**, keeping about the middle of the river. Leave Montgomery Point buoy (spar, black, No. 1) on the port hand, and haul in for the western side of the channel off Meadow Cove; anchor in 5 to 8 fathoms water.

Remarks.—Passing 3½ miles northward of Monhegan Island, Old Man Ledge, marked by a red iron spindle, will be made, and left ¼ mile on the starboard hand. Duck Rocks black whistling buoy and black beacon (wooden tripod), and Sunken Duck Rocks black spar buoy, all northward of Monhegan Island, will be left on the port hand when passing ½ mile north of the whistling buoy on the **NW.** by **W.** ¾ **W.** course. The Georges Islands and other islands and ledges at the mouth of Muscongus Bay will be left on the starboard hand.

On the **W.** ⅝ **N.** course Pemaquid Point Lighthouse will be left 1⅝ miles, and Pemaquid Ledge buoy (can, red and black horizontal stripes) ¼ mile, on the starboard hand.

Dangers.—**Old Man Ledge** is described on page 143.

The **Duck Rocks**, two bare ledges, and **Sunken Duck Rock**, with 6 feet of water on it, are marked, the former by a black beacon and black whistling buoy lying ⅞ and 1⅛ miles **NNW.** ¼ **W.** from Monhegan Island Lighthouse, and the latter by a black spar buoy lying 1 mile **N.** by **W.** ¼ **W.** from the lighthouse. A passage nearly ½ mile wide with good water leads eastward of these dangers, between them and Monhegan Island and **Eastern Duck Rock Island**, a small, bare island about ¼ mile northward of Monhegan Island.

Moser Ledge, lying 3¾ miles **SE.** ½ **E.** from Pemaquid Point Lighthouse, is described on page 145.

Pemaquid Ledge, a small detached ledge lying 1¼ miles **SW.** from Pemaquid Point Lighthouse, has a depth of 11 feet over it and is marked off its southeast end by a buoy (can, red and black horizontal stripes).

Inner Heron Island Ledge, with 2 feet of water on it, extends ¼ mile in a southwesterly direction from the southern end of Inner Heron Island and is marked on its southern end by a buoy (spar, red, No. 2).

The Bulldog is a rock bare at low water near the southern end of a ledge with 2 feet on it, making out ¼ mile in a southerly direction from the southern end of Inner Heron Island. It lies ¼ mile **ESE.** ¼ **E.** from red spar buoy No. 2.

North End Inner Heron Island Ledge, a part of which is bare at low water, makes out 300 yards northward from the northern end of Inner Heron Island. It is marked on its northern end by a buoy (spar, red, No. 4).

East Shore Rock, with 8 feet on it, is marked on its western side by a buoy (spar, red, No. 6) lying ¼ mile **SE.** ¼ **E.** from the northern end of Farnums Point. There is no safe passage eastward between this buoy and the shore of Rutherfords Island.

Kelp Ledge, with an unmarked rock, bare at low water, lies about 150 yards off the western shore abreast East Boothbay and 600 yards **WSW.** ¾ **W.** from the southern end of Jones Point.

A ledge extends about 200 yards eastward from Montgomery Point and has black spar buoy No. 1 on its eastern side.

1 A. ***Approaching and Entering, from Southward.***—Pass eastward of Pumpkin Island and the islands off the entrance, and steer northward, taking care to give the easternmost islands a berth of 1¼ miles, until Ram Island Lighthouse bears *W.* ⅝ *N.* and the south end of Thrumbcap Island bears *N.* distant ⅜ mile. Then proceed as directed in section 1, foregoing.

Remarks and dangers.—Standing northward, keeping 1¼ miles eastward of the islands, Outer Heron Island Ledge buoy (spar, red and black horizontal stripes) should be left at least ¼ mile on the port hand.

Outer Pumpkin Island Ledge, with 5¾ fathoms on it, **Southeast Breaker**, with 3¾ fathoms on it, **Pumpkin Island Eastern Ledge**, with 10 feet on it, **Outer Heron Island Ledge**, with 8½ feet on it and marked by a buoy (spar, red and black horizontal stripes), and **White Island Ledges**, with 5¾ fathoms on it, lying in a general **NNE.** ½ **E.** and **SSW.** ½ **W.** direction for about 4 miles, will be avoided by keeping at least 1¼ miles southward and 1¼ miles eastward of the islands.

1 B. *Approaching and Entering, from Westward.*—Shape the course so as to pass about 1½ miles south of Seguin Lighthouse, and from this position steer **NE.** by **E.** ⅛ **E.**, heading for Ram Island Lighthouse. When Ram Island Lighthouse is made steer for it on this course, and at night when eastward of Toms Rock keep in the white rays of the light. When about ¼ mile from the lighthouse haul a little northward, and give it a berth of about 300 yards, and when it bears *SW.* by *W.* ¾ *W.* steer **NE.** by **E.** ¾ **E.**; Inner Heron Island Ledge buoy (spar, red, No. 2) will be a very little on the starboard bow. When about 400 yards from the buoy change course to **N.** by **E.** ⅞ **E.**, and follow the directions in section 1, foregoing.

Remarks.—On the **NE.** by **E.** ⅛ **E.** course Toms Rock buoy (spar, red, No. 2) will be made on the port bow and left about ⅞ mile on the port hand. Damiscove Island will be made on the starboard bow and should not be approached closer than ⅝ mile from its southern end. The black bell buoy south of The Cuckolds and fog signal station (see table, page 20) will be made on the port bow and left on the port hand. When passing northward of Ram Island, pass about halfway between the lighthouse and red spar buoy No. 2, marking Gangway Ledge, and black spar buoy No. 1 should be left about 100 yards on the starboard hand.

Dangers.—**Mile Ledge,** with 10 feet of water on it, lies ⅞ mile **S.** ¾ **W.** from Seguin Lighthouse. It is marked on its southern side by a buoy (can, red and black horizontal stripes). There is deep water between this ledge and Seguin Island.

Toms Rock, with 9 feet over it, lies 2⅝ miles **NE.** by **E.** ⅞ **E.** from Seguin Lighthouse, and is marked on its southwestern side by a buoy (spar, red, No. 2).

An unmarked **11½-foot spot** lies nearly ⅝ mile **NW.** ½ **W.** from the southwestern end of Damiscove Island. It can be avoided by keeping Ram Island Lighthouse bearing eastward of **NE.**

The Cuckolds, two bare islets, are surrounded by ledges which make out 250 yards southward. The eastern islet is marked by a fog-signal station (see table, page 20), lying 2⅝ miles **WSW.** ½ **W.** from Ram Island Lighthouse. They are also marked by a large black bell buoy lying ⅝ mile **S.** by **W.** ¼ **W.** from the fog signal station, and can be avoided by keeping Ram Island Lighthouse bearing northward of **NE.** by **E.** ¾ **E.** There are several spots, with 14 to 16 feet of water over them, about ½ mile westward of the fog signal station.

Wylie Rock, with 16 feet over it and unmarked, lies ¾ mile **W.** from Ram Island Lighthouse; it can be avoided by keeping the lighthouse bearing northward of **E.** ½ **N.**

Gangway Ledge, with 7 feet of water on it, is marked on its southern side by a buoy (spar, red, No. 2) lying 600 yards **NNW.** from Ram Island Lighthouse. An unmarked 14-foot spot lies 400 yards **W.** ½ **N.** from this buoy.

Ram Island Ledge, with 12 feet of water on it, extends about 300 yards **NNE.** from the north end of Ram Island eastward of the lighthouse. A buoy (spar, black, No. 1) marks the north end of this ledge.

Green Island, lying about 200 yards south from Linekins Neck, is surrounded by shoals which extend 100 yards southward. There is a passage between it and the mainland with 16 feet of water, but it should not be attempted by strangers.

The Hypocrites, bare ledges joined by rocky shoals, extend in a general **NNE.** and **SSW.** direction for ⅝ mile. They are marked on their northern end by a black bell buoy, lying ½ mile **E.** by **S.** from Ram Island Lighthouse.

BOOTHBAY HARBOR.*

This is one of the best anchorages on the coast of Maine, and is much used as a harbor of refuge by all classes of vessels. It lies 14 miles **NW.** by **W.** ¾ **W.** from Monhegan Island and 7 miles **NE.** by **E.** ¾ **E.** from Seguin Island and is marked at its eastern entrance by **Ram Island Lighthouse,** and at the western point at its entrance by Cuckolds Fog Signal (see table, page 20). Lying south of the entrance are several islands and a number of rocks and ledges. The harbor is easy of access and can be entered without a pilot; the principal dangers are marked and easily avoided by vessels of any draft. The entrance between Linekins Neck on the east and Cape Newagen on the west is 2⅝ miles wide; **Squirrel Island** lies in the middle between these points with a good channel on either side of it; this island is a popular summer resort. **Burnt Island Lighthouse** is ⅞ mile north of Squirrel Island, and is the principal guide to the anchorage in the harbor.

Linekins Bay makes in northeastward between Linekins Neck and **Spruce Point** (the point ⅞ mile east of Burnt Island); it is a good anchorage but is little used. There are several dangerous ledges, marked by buoys, between the entrance and the head of the bay, and Spruce Point ledges (buoyed) lie on the northern side of its entrance.

The town of **Boothbay Harbor** is on the eastern arm at the head of Boothbay Harbor. The deepest draft entering here is 21 feet; the usual draft is about 12 feet; there is from 4 to 12 feet of water alongside the

*Shown on charts **105**, scale $\frac{1}{80,000}$, price $0.50; **311**, scale $\frac{1}{40,000}$, price $0.25.

wharves; a least depth of 30 feet at low water can be carried in the channel to the anchorage near the head of the harbor off McKowns Point.

Channels.—There are three channels by which to approach the harbor. The channel from eastward, north of Ram Island, has a depth sufficient for the largest vessels, but there are some unmarked spots with 14 to 24 feet of water over them, lying northwestward and westward from Ram Island. The channel westward of Squirrel Island has a depth sufficient for the largest vessels, but there are three unmarked spots with from 19 to 25 feet of water nearly in the middle of the channel between Squirrel and Burnt islands. The channel from southward, leading east of Squirrel Island, leads in the deepest water, and 8 fathoms can be taken up to the anchorage.

Anchorages.—The usual and best anchorage is northward of Tumbler Island and to the head of the harbor; there is 3 to 7 fathoms of water and good holding ground anywhere in the channel above the island, the water shoaling gradually toward the head of the harbor. The anchorage in East Harbor, off the town, has a depth of 4 to 5 fathoms, but is limited in area and usually occupied by small craft and fishermen.

Pilots.—Strangers sometimes take a pilot, lying off Cape Newagen or southward of Squirrel Island with signal flying until they are boarded.

Towboats are seldom used by vessels entering or leaving the bay; they can be had in about 1½ hours by telegraphing to Bath.

Supplies.—Anthracite coal in limited quantity can be had alongside one of the wharves that has 13 feet at high water. Water can be taken alongside the wharves or from water boat. Provisions and some ship-chandler's stores can be obtained in the town.

Repairs.—There are good facilities for repairing hulls of wooden vessels, and two marine railways, one capable of hauling out vessels of 200 tons, the other of 150 tons.

Storm warning displays of the United States Weather Bureau are made from a staff on the eastern side of the harbor on Mount Pisgah, and are visible to vessels in the harbor.

Marine Hospital.—Relief is furnished by the United States Public Health and Marine-Hospital Service as for stations of Class III (see Appendix IV).

Ice occasionally, in severe winters, obstructs navigation above Tumbler Island during February and March.

The **tidal currents** have little velocity in the harbor and require no special precaution. For **tides** see table, page 27.

SAILING DIRECTIONS, BOOTHBAY HARBOR.

The directions in section 1, or 1 A, are good for vessels of 17 feet draft in the daytime or at night, with clear weather. The directions in section 1 B are good for the deepest-draft vessels in the daytime, when the buoys can be seen.

1. ***Approaching and Entering, from Eastward or Southward, through Fisherman Island Passage.***—I. Follow the directions in section 1 or 1 A, "Sailing Directions, Damariscotta River," page 147, and when Ram Island Lighthouse is made, bearing **W.** ⅝ **N.**, steer for it, keeping it on that bearing—or, at night, keep in the white rays of the light. Pass 300 yards northward of the black bell buoy marking The Hypocrites, and steer **WNW.** ¾ **W.** so as to pass 60 yards north of black spar buoy No. 1 and 300 yards northward of Ram Island Lighthouse. Bring Burnt Island Lighthouse to bear **NW.** by **N.**, and head for it, keeping it on that bearing—or, at night, keep in the white rays of the light. Leave the northern end of Squirrel Island about 400 yards on the port hand, and when 500 yards from Burnt Island change the course to **N.** ½ **E.** Leave Burnt Island and Mouse Island about 400 yards on the port hand, and Tumbler Island 300 yards on the starboard hand. When past Tumbler Island haul eastward, course about **NE.** by **N.**, and anchor in the middle of the harbor in from 4 to 7 fathoms water, soft bottom.

II. To anchor in East Harbor, off the town.—When Tumbler Island bears *SE.*, steer about **NE.** by **E.**; give the south shore a berth of 250 yards, and pass 150 yards southward and eastward of McFarlands Island; anchor southeastward of black spar buoy No. 3 in about 4 fathoms.

III. To enter Linekins Bay.—Proceed as directed in paragraph I, preceding, and when on the **NW.** by **N.** course for Burnt Island, the southern end of Squirrel Island bears abeam (*SW.* by *W.*), steer **NE.** by **N.**, passing midway between Negro Island and black spar buoy No. 1; then steer about **NE.** and anchor ¼ mile southward of Southwest Point Cabbage Island buoy (spar, black, No. 3), in 9 to 12 fathoms, soft bottom.

Remarks.—Approaching Fisherman Island Passage from eastward or southward, the remarks and dangers are given under section 1 or 1 A, "Sailing Directions, Damariscotta River," pages 146–147.

On the **NW.** by **N.** course Cards Ledge buoy (spar, red, No. 4) will be left ¼ mile, and the two buoys at the entrance to Linekins Bay about ⅝ mile, on the starboard hand. Squirrel Island should not be approached nearer than 400 yards at its northeastern end because of shoals making out from it. Black spar buoy No. 1 will be on the port bow open southward of Burnt Island.

On the **N. ½ E.** course the eastern end of McKowns Point will be ahead, and red spar buoy No. 6 will be left about ¼ mile on the starboard hand. Between Mouse Island and McKowns Point there is good anchorage in from 7 to 9 fathoms of water. There is a narrow passage eastward of Tumbler Island, between it and Spruce Point, but strangers are advised not to attempt it.

Dangers.—**Ram Island Ledge** is described on page 148.

Gangway Ledge, with 7 feet of water on it, is marked on its southern end by a buoy (spar, red, No. 2) lying about 600 yards **NNW.** from Ram Island Lighthouse. An unmarked 15-foot rock lies 800 yards **NW. ½ N.** from Ram Island Lighthouse.

Cards Ledge, with a bare rock about midway its length and 1 foot of water at its southern end, makes out for ¼ mile in a general **SSW.** direction from the southwestern end of Linekins Neck; it is marked at its southern end by a buoy (spar, red, No. 4).

Spruce Point Ledges, at the entrance to Linekins Bay, are about ¼ mile long in a general **N.** by **W.** and **S.** by **E.** direction, and show bare spots at low water. They are marked on their southern end by a buoy (spar, black, No. 1), and on their northern end by a buoy (spar, red, No. 2).

Tumbler Island Ledge, with 12 feet on it, lying about ½ mile **E. ½ N.** from Burnt Island Lighthouse, is marked on its western side by a buoy (spar, red, No. 6). There is a passage eastward of the buoy by giving it a berth of 250 yards.

McFarland Ledge buoy (spar, black, No. 3) is about 100 yards east of **McFarlands Island,** at the north side of the entrance to East Harbor, and ⅝ mile **NE. ¾ N.** from the north point of Tumbler Island.

1 A. ***Approaching and Entering, from Westward or Southward.***—Follow the directions in section 1 B, "Sailing Directions, Damariscotta River," page 148, until the fog signal on The Cuckolds bears *N.*, distant about ¾ mile, then steer **N.** by **E. ¾ E.** for Burnt Island Lighthouse—or, at night, keep in the white rays of the light. Pass about ¼ mile eastward of The Cuckolds, and the same distance westward of Squirrel Island; black spar buoy No. 1, marking Burnt Island Ledge, will be ahead and about in range with Burnt Island Lighthouse. When about ½ mile from the lighthouse, and Squirrel Island Ledge buoy (spar, red, No. 4) is a little abaft the starboard beam, steer **NE. ½ E.** about ⅝ mile, and when Burnt Island Lighthouse is on the port beam, steer **N. ½ E.**; give Burnt Island a berth of 400 yards, and follow the directions given in section 1, foregoing.

Or, coming from Southward, when south of Bantam Rock red whistling buoy, steer so as to pass ⅝ mile westward of the buoy, and then steer **N.** by **E. ¾ E.** for Burnt Island Lighthouse—or, at night, keep in the white rays of that light, and follow the directions in the foregoing paragraph.

To enter Linekins Bay.—Bring the black bell buoy marking The Cuckolds to bear *W.*, distant ½ mile, and steer **NE. ½ N.** for Negro Island; give the southeastern end of Squirrel Island a berth of about 500 yards, and when past this end of the island, haul a little more northward, so as to pass about 200 yards northward of Negro Island. Continue the **NE. ½ N.** course into Linekins Bay, passing midway between Negro Island and black spar buoy No. 1, and anchor southward of Cabbage Island in from 9 to 12 fathoms water.

Remarks.—For remarks and dangers, approaching from westward, until up with The Cuckolds, see section 1 B, "Sailing Directions, Damariscotta River," page 148. The black bell buoy off The Cuckolds will be left about 400 yards on the port hand. Coming from southward, after leaving Bantam Rock whistling buoy, Bantam Rock buoy (nun, red, No. 2) will be made on the starboard bow and left about 1 mile on the

starboard hand. The Cuckolds are bold-to on their eastern side and may be approached to about 150 yards. Squirrel Island should not be approached closer than 250 yards on its western side. Squirrel Island Ledge buoy (spar, red, No. 4) will be made on the starboard bow and left about 300 yards on the starboard hand.

Approaching Linekins Bay from westward Squirrel Island should not be approached closer than 250 yards on account of shoals making out from its eastern side. **Cabbage Island** is the narrow, high island lying about 1 mile **N.** by **E.** ¾ **E.** from the northern end of Negro Island.

Dangers.—**Bantam Rock** is described on page 85.

Squirrel Island Ledge makes out ¼ mile in a **NW.** direction from the northern end of Squirrel Island. It is marked on its end by a buoy (spar, red, No. 4).

Burnt Island Ledge, with 4½ feet on it, is marked on its southern side by a buoy (spar, black, No. 1). This buoy should be given a berth of over 150 yards when passing eastward of it. There is no safe passage between it and Burnt Island. There is a **small unmarked spot** with 19 feet over it about 250 yards **S.** by **W.** ¾ **W.** from the buoy marking Burnt Island Ledge.

The remaining dangers are described under section 1, foregoing.

1 B. ***Approaching and Entering.—Vessels of over 17 feet draft.***—Follow the directions in section 1 A, and when standing for Burnt Island Lighthouse bring the fog signal on The Cuckolds to bear *NW.* by *W.*, distant ½ mile. Then steer **NE.** ½ **N.**, heading for Negro Island and so as to leave Squirrel Island about 500 yards on the port hand. When Ram Island Lighthouse is abeam, and Burnt Island Lighthouse bears **NW.** ¾ **N.**, steer for the latter on that bearing, and when it is ¼ mile distant ahead steer **N.** ½ **E.** for the eastern end of McKowns Point. When past Tumbler Island haul eastward a little and anchor in 7 fathoms, soft bottom.

See the remarks and dangers in section 1 A. **Wylie Rock,** a small, unmarked, 16-foot spot, lies ¼ mile **SE.** ¼ **S.** from the southeastern end of Squirrel Island.

SHEEPSCOT BAY AND RIVER.*

Sheepscot Bay, the approach to Sheepscot River, has deep water, and the principal dangers are either marked by buoys or can be seen at any stage of the tide. It lies between Cape Newagen on the east and Salters Island, at the entrance of the Kennebec River, on the west.

Sheepscot River extends in a **NNE.** direction 18½ miles to the village of Sheepscot. Its entrance is about 5 miles **NE.** from Seguin Island and between Cape Newagen on the east and Griffiths Head on the west. **Hendricks Head Lighthouse** (see table, page 20), on the eastern bank of the river, about 2¾ miles above its mouth, is the guide for entering. Sheepscot Falls, about 16¾ miles above its mouth, is the head of navigation for vessels of over 5 feet draft; 5 fathoms can be taken to Wiscasset at low water. Between Wiscasset and Sheepscot Falls two bridges cross the river; the width of the draws is about 33 feet.

Cape Harbor is an anchorage for small craft between Cape Newagen and Cape Island; it is only used by local fishermen.

Herman Harbor is a long, narrow cove making in northward on the western bank of the river about 1½ miles above Griffiths Head. It has good anchorage in 4 to 7 fathoms water, but has a very narrow entrance. There is a small village on its western shore.

Christmas Cove is a small, shallow cove in the eastern bank about 1⅝ miles southward of Hendricks Head.

Hendricks Harbor is a small harbor, the entrance to which lies about ⅝ mile **SSE.** from Hendricks Head. Only small local vessels use this anchorage, the depth being 5 to 8 feet at low water. There is a small village on its eastern shore.

Five Islands Harbor is a narrow passage between the Five Islands and the Georgetown Island shore, forming a small but secure harbor with 3 to 5 fathoms at low water. The entrance is opposite Hendricks Head Light; house and bearing about **WNW.** ½ **W.** from it. The village of **Five Islands** is on the western shore of the harbor.

Ebenecook Harbor is an excellent anchorage for vessels up to 20 feet draft; its entrance lies about 1 mile above Hendricks Head Lighthouse on the eastern bank of the river, and leads between Dog Fish Head on the south and the Green Islands on the north. It is the first anchorage available for large vessels entering the river; but the entrance is narrow, and large sailing vessels require a fair wind when leaving the anchorage. The village of **West Southport** is at the southern end of the harbor; steamers plying between Boothbay Harbor

* See footnote on page 148.

and Bath stop here; this end of the harbor should be avoided by strangers unless they employ a pilot. There is from 4 to 10 feet of water alongside the wharves of the village. Strangers generally take a pilot when bound to West Southport.

Townsend Gut, leading into Boothbay Harbor, is northward of Ebenecook Harbor (see inside passage from Boothbay Harbor to Bath).

Little Sheepscot River and **Goose Rock Passage** are in the western bank, the former on the south and the latter on the north side of McMahans Island; they both lead into Sassanoa River.

Back River is a shallow, and in places narrow, stream, between Barters Island and the mainland; its entrance is on the eastern side about 3¼ miles northward of Hendricks Head.

On the west bank of the river, opposite the entrance to Back River, are three small coves, **Jewetts, Long,** and **Tarbox coves.** The village of **Westport** is on the west bank opposite the southern end of Barters Island.

Cross River makes eastward at the northern end of Barters Island, about 6¼ miles above Hendricks Head. This river has a good deep channel for 1¼ miles, but is little used except by vessels loading ice; Back River makes into it from southward about ⅜ mile from its entrance.

Wiscasset is a town on the west bank of the river 11 miles above Hendricks Head Lighthouse, and can be reached by deep-draft vessels; the usual draft of vessels entering here is 10 to 16 feet. **Sheepscot Falls** is about 3 miles above Wiscasset; 20 feet of water can be taken up to it.

Sheepscot, a village about 4¼ miles above Wiscasset, can only be reached by vessels of less than 5 feet draft.

Prominent features.—Seguin Island and lighthouse are the offshore guide to the entrance. **Southport Island,** on the eastern side of the entrance, is high and wooded; on its western side, about 2¾ miles above The Cuckolds, is **Hendricks Head Lighthouse.** The western shore is comparatively low; **Griffiths Head,** a whitish, rocky point about 30 feet high, is the western point at the entrance to the river and lies about 4¼ miles **NE.** by **N.** from Seguin Lighthouse.

The channel of the river up to Hendricks Head Light is wide, with few dangers, but above this for a distance of about 3¼ miles it leads between islands, rocks, and ledges—the most dangerous of which are marked by buoys—which contract the channel to a width of ¼ mile in its narrowest part. Above the village of Westport the channel is comparatively free from dangers until up to Davis Island, where it makes a sharp turn westward and forms Wiscasset Harbor; at this point there are several rocks marked by a buoy. The least depth in the channel, by following the sailing line, is about 9¼ fathoms until nearly up to Wiscasset. Above Wiscasset the channel is narrow and crooked.

Anchorages.—**Jewetts Cove,** in the west bank, about 2¾ miles above Hendricks Head, has good anchorage for light-draft vessels. **Colbys Cove,** in the west bank, about 2¼ miles above Cross River, affords good anchorage in 4 to 8 fathoms. Merrills Ledge spindle is northeastward of the anchorage. The best anchorage at Wiscasset is below the bridge and well over toward the wharves of the town. Above Wiscasset vessels bound to Sheepscot Falls anchor anywhere in the channel where the bottom and depth are suitable.

Pilots can be had by making signal when entering the bay and standing up to Hendricks Head. Strangers entering the river usually take a pilot or towboat. Vessels bound to Sheepscot Falls generally take a pilot at Wiscasset.

Towboats are sometimes used by vessels bound up the river; they can be had from Wiscasset or the Kennebec River. Vessels bound above Wiscasset generally tow.

Supplies.—Anthracite coal in limited quantities can be obtained at the wharf near coal depot at Wiscasset. Provisions can be had at Wiscasset.

Repairs.—The nearest places having marine railways and where repairs to wooden vessels can be made are Boothbay Harbor and Bath. Repairs to machinery of steamers and hulls of steel or iron vessels can be made at Bath.

Marine Hospital.—Emergency relief is furnished at Wiscasset by the United States Public Health and Marine-Hospital Service as for stations of Class IV (see Appendix IV).

Ice does not interfere with navigation up to Wiscasset. Ebenecook Harbor is always open. Above Wiscasset the river is closed by ice for a distance of 3 miles below Sheepscot Falls.

For **tides** see table, page 27.

Currents.—The currents in the river generally set in the direction of the channel and have considerable velocity in the narrow parts. At the entrance to Cross River the flood sets on to Quarry Point. The ebb sets on to Cloughs Point.

SAILING DIRECTIONS, SHEEPSCOT RIVER TO WISCASSET.

1. ***Approaching and Entering, from Eastward.—I. Through Fisherman Island Passage.***—Follow the directions in section 1 or 1 A, "Sailing Directions, Damariscotta River," page 146, and when Ram Island Lighthouse bears **W.** ⅝ **N.** steer for it and pass 300 yards northward of the black bell buoy marking the Hypocrites. Then steer **WNW.** ¾ **W.** and pass 60 yards north of Ram Island Ledge buoy (spar, black, No. 1) and 300 yards northward of Ram Island Lighthouse. Round the lighthouse, giving it a berth of 300 yards, and bring it to bear *NE.* by *E.* ½ *E.* and steer **SW.** by **W.** ½ **W.** Pass southward of the black bell buoy marking The Cuckolds, and steer about **W.** by **N.** for ⅞ mile, and when the south end of Cape Island is in range with the southeast point of Squirrel Island, steer **NNW.** Pass about ¾ mile westward of Lower Mark Island and when the island bears *ESE.* ½ *E.*, distant ¾ mile, steer **N.** by **E.** ½ **E.** Leave Cat Ledges buoy (spar, red, No. 0) 500 yards on the starboard hand and pass ⅜ mile west of Cat Ledges and 350 yards westward of Hendricks Head Lighthouse. Then follow the directions in section 2.

II. From the whistling buoy off Bantam Rock.—From a position ½ mile westward of Bantam Rock whistling buoy steer **N.** ½ **W.** for 6 miles, and bring Lower Mark Island to bear *ESE.* ½ *E.*, distant ¾ mile. Then steer **N.** by **E.** ½ **E.** Leave Cat Ledges buoy 500 yards on the starboard hand and pass 350 yards westward of Hendricks Head Lighthouse. Then follow the directions in section 2.

To anchor in Ebenecook Harbor.—Continue the **N.** by **E.** ½ **E.** course about ¾ mile past Hendricks Head Lighthouse; Dog Fish Head will then bear *E.;* then steer so as to pass about 100 yards northward of it, between it and the Green Islands, taking care to leave the latter at least 150 yards on the port hand. When past the southernmost point of the Green Islands haul a little northward, keeping about 200 yards from the islands, and when the southernmost point bears *W.*, steer **E.** and anchor about 200 yards from the eastern shore in about 4 fathoms, soft bottom.

Remarks.—Approaching Ram Island Lighthouse, the remarks and dangers are given under sections 1 and 1 A, "Sailing Directions, Damariscotta River." On the **SW.** by **W.** ½ **W.** course the fog signal marking The Cuckolds will be on the starboard bow, and ⅜ mile southward of it will be seen the black bell buoy bearing a little on the starboard bow.

On the **NNW.** course Lower Mark Island will be broad off the starboard bow, and as the island approaches an **ESE.** ½ **E.** bearing, Cat Ledges buoy (spar, red, No. 0) will be seen ½ mile **NW.** ¼ **W.** from the island.

On the **N.** by **E.** ½ **E.** course, after passing Cat Ledges buoy, the bare rock at the northern end of Cat Ledges should be left about ⅜ mile on the starboard hand. Hendricks Head Lighthouse will be a little on the starboard bow.

Entering Ebenecook Harbor, give the eastern shore above Hendricks Head a berth of over 300 yards until nearly up to Dog Fish Head. The southern end of Green Island should not be approached nearer than 150 yards, to avoid the ledge making out from it. **Dog Fish Head** is a small, bare, rocky headland, with a deep chasm showing westward; when seen from southward it looks like a small bare islet, the land connecting it with the mainland being low.

Dangers.—**The Cuckolds** are two bare rocks surrounded by ledges except on the eastern side, the easternmost marked by a fog-signal station (see table, page 20), lying 2⅜ miles **WSW.** ½ **W.** from Ram Island Lighthouse. **Collectors Ledge**, with 6 feet of water on it, makes out about 250 yards southward from The Cuckolds. An unmarked **16-foot spot** lies ½ mile **W.** by **S.** from the fog-signal station.

Cat Ledges, bare at low water, extend ½ mile in a general **SSE.** ½ **E.** direction from a bare rock which marks its northern end, and which lies 1 mile **S.** ½ **W.** from Hendricks Head Lighthouse. Nearly ⅝ mile **SSW.** from the northern rock of the Cat Ledges is a small ledge with a least depth of 3¾ fathoms over it, and marked by a buoy (spar, red, No. 0).

Cedarbush Ledge, with 10 feet of water on it, lies nearly ¼ mile **S.** ¼ **W.** from Hendricks Head Lighthouse and 200 yards **SW.** from Cedarbush Island.

An unmarked **15-foot spot** lies in Ebenecook Harbor 400 yards **SE.** from the southern end of Green Islands, and can be avoided by keeping Dog Fish Head bearing southward of **W.** ½ **N.**

1 A. ***Approaching and Entering, from Westward or Southward.—I. Passing north of Seguin Island.***—Follow the directions in section 1 C, "Sailing Directions, Kennebec River," and when about 300 yards south of the bell buoy off Pond Island, steer **ENE.** ½ **E.**, heading for the fog-signal station on The Cuckolds. Pass about midway

between The Sisters and the Black Rocks, and when Sisters beacon bears *SW.* ¾ *S.*, steer **NE.** ¾ **N.**, keeping the beacon on the bearing astern. Leave the Black Rocks, and Griffiths Head Ledge buoy ⅝ mile on the port hand, and when Lower Mark Island bears *ESE.* ½ *E.*, distant ¾ mile, steer **N.** by **E.** ½ **E.** and follow the directions in section 1, preceding.

Remarks and dangers.—The **ENE.** ½ **E.** course leads about 400 yards north of the black spar buoy marking White Ledge. On a clear day the fog signal on The Cuckolds will be seen when at the bell buoy; it should be kept ahead on the above course. The beacon on The Sisters is a prominent mark, and the course leads nearly ⅝ mile north of it.

White Ledge is described on page 160.

The Sisters, three small bare rocks with shoals surrounding them for about 100 yards, lie 2⅛ miles **ESE.** ¾ **E.** from Pond Island Lighthouse. The westernmost of the three rocks is marked by a black tripod beacon.

The Black Rocks are two bare islets and a rock awash at high water, extending ⅝ mile in a general **NE.** ½ **N.** and **SW.** ½ **S.** direction, the northern one lying 1⅛ miles **S.** ¾ **W.** from Griffiths Head. There is a 13-foot spot about 300 yards **SW.** from the southern bare rock.

On the **NE.** ¾ **N.** course the Black Rocks, which show bare and are marked by breakers, are left well on the port hand; the red and black horizontally striped spar buoy will be made on the port bow after passing the rocks. As **Lower Mark Island** (the small island lying on the east side of Sheepscot Bay, about 1⅝ miles northwestward of The Cuckolds) approaches an **ESE.** ½ **E.** bearing, Cat Ledges buoy should be made on the starboard bow.

Sloop Ledge, with 6 feet of water on it, lies 1 mile **SSW.** ¾ **W.** from Griffiths Head; it is marked by a buoy (spar, black, No. 1) lying 100 feet **S.** from the ledge.

Griffiths Head Ledge, with 7 feet of water on it, lies ½ mile **E.** by **S.** from Griffiths Head, and is marked on its southern end by a buoy (spar, red and black horizontal stripes). The remaining dangers are given under section 1, foregoing.

II. Passing South of Seguin Island.—From a position 1½ miles south of Seguin Lighthouse steer **NE.** ½ **E.**, heading for the fog-signal station on The Cuckolds. Having stood on this course about 3½ miles, the beacon on The Sisters should bear on the port beam, distant about 1 mile. Then steer **N.** by **E.** ⅝ **E.** about 3¾ miles; Lower Mark Island should then bear *ESE.* ½ *E.*, distant ¾ mile. Then steer **N.** by **E.** ½ **E.**, leave Cat Ledges buoy 500 yards on the starboard hand, and follow the directions in section 1 preceding.

Remarks.—On the **NE.** ½ **E.** course. Toms Rock buoy (spar, red, No. 2) will be left ½ mile on the port beam just before The Sisters beacon bears abeam.

The **N.** by **E.** ⅝ **E.** course leads fair into the middle of the entrance, and Hendricks Head and lighthouse will be made nearly ahead, a very little on the starboard bow. As Lower Mark Island approaches an **ESE.** ½ **E.** bearing, Cat Ledges buoy (spar, red, No. 0) will be made on the starboard bow.

Dangers.—**Mile Ledge,** with 10 feet of water on it, lies ⅞ mile **S.** ¾ **W.** from Seguin Lighthouse. It is marked on its southern side by a buoy (can, red and black horizontal stripes).

Toms Rock, a small detached ledge with 9 feet of water on it, lies 2⅝ miles **NE.** by **E.** ⅞ **E.** from Seguin Lighthouse and nearly ⅝ mile **S.** by **E.** of the beacon on The Sisters, and is marked by a buoy (spar, red, No. 2) lying 200 yards **SW.** by **S.** from the shoalest part of the ledge.

There is an **18-foot spot** nearly midway between Toms Rock and The Sisters.

2. ***From Hendricks Head Lighthouse to Stover Ledge.***—When Hendricks Head Lighthouse bears *ESE.* ½ *E.*, distant about 350 yards, shape a course **N.** by **E.** ½ **E.** A number of small islands will be seen on both bows. The first natural mark is *Middle Mark Island* (small, bare, rocky islet) about 1½ miles above Hendricks Head, which will be a little on the port bow. The course leads nearly 500 yards east of Bull Ledge buoy (spar, red and black horizontal stripes) and 300 yards east of Middle Mark Island.

The **N.** by **E.** ½ **E.** course continued for 1 mile after passing Middle Mark Island leaves on the port hand: a horizontally striped spar buoy 300 yards, a black spindle 400 yards, a black can buoy No. ½ about 400 yards, and a horizontally striped spar buoy 450 yards. After passing the black can buoy, a red spar buoy No. 2 (on Powderhorn Ledge) will be left 175 yards on the starboard hand.

About ¾ mile above the latter buoy *Upper Mark Island* (small, bare, rocky islet) will be seen on the port bow, and the **N.** by **E.** ½ **E.** course should lead 350 yards east of the

island. The course continued for ⅝ mile above Upper Mark Island leaves black spar buoy No. 3 about 300 yards on the port hand and Stover Ledge buoy (spar, red, No. 4) about 250 yards on the starboard hand. Then follow the directions in section 3 following.

Dangers.—An unmarked 16-foot spot lies 300 yards from the eastern shore and ⅝ mile **N.** by **E.** ½ **E.** from Hendricks Head Lighthouse.

Ball Ledge, with 9 feet of water on it, extends 400 yards **N.** by **E.** ½ **E.** from the buoy (spar, red and black horizontal stripes) marking its southern end, and which lies nearly ⅞ mile **N.** by **W.** ¼ **W.** from Hendricks Head Lighthouse.

Middle Mark Island, a small, round, bare islet, is in the middle of a ledge making ¼ mile in a **N.** by **E.** and **S.** by **W.** direction, and lies about ¼ mile eastward of McMahans Island and 1¼ miles **N.** ½ **E.** from Hendricks Head Lighthouse. **Mark Island Ledge,** with 7 feet on it, extends parallel to and about 100 yards westward of the above-mentioned ledge.

Hardings Ledge, with 8 feet of water on it, lies on the eastern side of the channel and extends 400 yards in a **SSW.** direction southward of buoy No. 2, marking Powderhorn South Ledge. There is a channel about 80 yards wide south of the buoy, between it and the northern end of Hardings Ledge. The south end of Hardings Ledge is marked by a buoy (nun, red, "H. L.").

Powderhorn South Ledge, awash in places at low water, extends a little over ¼ mile **S.** from Powderhorn Island. It is marked on its southern end by a buoy (spar, red, No. 2).

Middle Ledge, off the southern side of the entrance to Goose Rock Passage, has 10 feet of water on it, and is marked on its southern side by a buoy (spar, red and black horizontal stripes).

Clous Ledge, on the west side of the channel and on the north side of the entrance to Goose Rock Passage, is awash at half tide, and is marked by a black spindle on the middle of the ledge and a buoy (can, black, No. ½) off its northern end.

Powderhorn Ledge makes out 400 yards in a **N.** by **W.** direction from the northern end of Powderhorn Island. It is marked on its northern end by a buoy (spar, red, No. 2).

Four-Foot Rock lies on the west side of the channel about ¼ mile **N.** ½ **E.** from Clous Ledge spindle. It is marked on its southern side by a buoy (spar, red and black horizontal stripes).

An unmarked 18-foot rocky spot lies on the west side of the channel ¼ mile **S.** by **W.** ½ **W.** from Upper Mark Island, and can be avoided by keeping the island bearing northward of **N.** ½ **E.** when within ½ mile of it.

Upper Mark Island has a shoal making out 600 yards **N.** by **E.** ½ **E.**, and extending almost to black spar buoy No. 3, marking Hodgdon Ledge.

Ram Island Ledge, awash in spots at low water, is on the east side of the channel and extends ⅜ mile in a **NNE.** direction from Ram Island to the entrance to Back River. It is marked near its northern end by a buoy (spar, black, No. 1), which is a guide to the entrance to Back River.

Hodgdon Ledge, on the western side of the channel, lies ⅜ mile **N.** by **E.** ¾ **E.** from Upper Mark Island. It is bare at half tide, and marked on its southern side by a buoy (spar, black, No. 3).

Stover Ledge, on the east side of the channel 3⅝ miles above Hendricks Head Lighthouse and ¼ mile **N.** by **W.** from the southern end of Barters Island, is bare at low water and marked on its southwestern end by a buoy (spar, red, No. 4).

3. ***From Stover Ledge to Wiscasset.***—From Stover Ledge buoy continue the **N.** by **E.** ½ **E.** course for ¾ mile, and when in mid-river change the course to **NE.** ¾ **N.**, heading fair between Quarry Point on the east and Fowles Point on the west; Greenleaf Ledge buoy should be left about 300 yards on the port hand, and the bank at Fowles Point (on the port hand) should be given a berth of 150 yards.

When Quarry Point is on the starboard beam haul more northward and follow a mid-river course for about 2 miles, and when nearly up to Merrill Ledge spindle haul over toward the west bank so as to leave the spindle and North End Merrill Ledge buoy on the starboard hand. When past the latter buoy follow a mid-river course for 1¼ miles; Cloughs Point buoy (spar, black, No. 5½) will then be on the port beam. Then haul westward, favoring the north bank off Cloughs Point, and steer about **WNW.** Leave Seal Rock buoy on the port hand, and steer about **N.** by **W.** for the wharves and so as to leave Middle Ground buoy on the starboard hand. Anchor off the wharves in 4 to 6 fathoms.

Remarks.—From Stover Ledge to Wiscasset the river is comparatively unobstructed and a mid-river course leads clear of danger. **Quarry Point,** on the east side of the river, 6½ miles above Hendricks Head, is well wooded; in light winds vessels should not pass close to the point on a flood current. **Fowles Point** slopes gradually toward the water. It is grassy, with a few scattered trees. There are several houses back from the

end of the point. The channel makes a sharp turn westward at Cloughs Point; on the ebb vessels should pass well northward of the point, so as not to be set on it by the current.

Dangers.—Greenleaf Ledge, ⅜ mile **SSW.** ½ **W.** from the southern end of Fowles Point, is a small, bare rock surrounded by ledges, and marked on its southeastern side by a buoy (spar, black, No. 5).

An extensive shoal, with from 4 to 16 feet of water on it, extends 1 mile in a **SW.** direction from Fowles Point, and fills up the bight in the western bank, the approach to the entrance to McCarteys, Greenleaf, and Fowles coves.

Merrill Ledge, bare at half tide, extends a little over ¼ mile in a **NE.** by **N.** direction from the red spindle marking its southern end. There is no passage between this spindle and the eastern bank. The north end of the ledge is marked by a buoy (spar, red, No. 6).

An unmarked shoal, with 8 feet on it, makes out 400 yards in a **NE.** by **N.** direction from Hiltons Point, which is on the western bank ¾ miles southward of Cloughs Point. An unmarked 17-foot spot lies 600 yards **NE.** by **N.** from Hiltons Point, and 200 yards from the western bank.

Cloughs Point has ledges making out about 175 yards from it, and should be given a berth of about 250 yards.

Seal Rock, bare at half tide, lies 500 yards **NW.** by **W.** from the northern end of Cloughs Point; it is marked on its northern end by a buoy (spar, black. No. 7).

Middle Ground, with 10 feet of water on it, lies in the northeastern side of the harbor, and its southern end lies **NW.** from the southern end of Davis Island, leaving a passage about 350 yards wide between it and the wharves at the southern part of the town; its southern end is marked by a buoy (spar, red, No. 8).

Birch Point Ledge, unmarked, with 7 feet of water on it, lies about ⅝ miles **NNW.** from black buoy No. 7, and about 250 yards from the southern end of The Boom.

INSIDE PASSAGE FROM BOOTHBAY HARBOR TO BATH.*

This passage is about 11 miles long and leads between the islands lying between Boothbay Harbor and the Kennebec River, forming an inland passage from Boothbay Harbor to Bath. The only vessels using this passage are the small steamers running from Boothbay Harbor to Bath, and small vessels owned in the vicinity.

The channel is very narrow in some places, has strong tidal currents, is much obstructed by rocks and shoals, and, although many of the dangers are marked, strangers should not attempt to pass through without a pilot. The passage leads through Townsend Gut, across Sheepscot River, through Goose Rock Passage into Sassanoa River; about midway through Sassanoa River the channel crosses the southeastern part of Hockomock Bay, and then continues through the Sassanoa River, coming out in the Kennebec River opposite the city of Bath.

Townsend Gut is a narrow, crooked passage leading from Boothbay Harbor into Sheepscot River; the eastern entrance to the gut is **NW.** from Mouse Island, in Boothbay Harbor; its western entrance lies **E.** from Boston Island, in Sheepscot River, and northward of Ebenecook Harbor. A drawbridge crosses Townsend Gut about ½ mile from its eastern end.

Goose Rock Passage is on the western side of Sheepscot River, north of McMahans Island, and leads westward into the eastern end of Sassanoa River.

Little Sheepscot River is a narrow passage leading from Sheepscot River into the entrance of Sassanoa River southwestward of McMahans Island.

Sassanoa River is an estuary leading from Sheepscot River to Kennebec River, north of Georgetown and Arrowsic islands; it has numerous coves and bays making off northward and southward, but none of them are of commercial importance. Near its western end the river is crossed by a drawbridge. The principal coves and bays making southward are Robin Hood Cove, Riggs Cove, Halls Bay, and Back River, the latter separating Georgetown and Arrowsic islands. Northward is Heals Cove and Hockomock Bay; from the latter Montseag and Brookings bays lead northward; the former separates Westport Island from the mainland, and joins the Sheepscot River at Wiscasset, through Black River. Knubble Bay is the broadest part of the river, after passing Robin Hood Cove and The Knubble, before entering Hockomock Bay when coming from eastward. **Great Hell Gate** is the crooked passage from Knubble Bay into Hockomock Bay. **Upper Hell Gate** is about 2 miles from the western entrance to the river; this is the narrowest part, and is only about 60 yards wide.

No directions of practical use can be given for this passage; small steamers, or yachts, desiring to pass through should take a pilot at Boothbay Harbor or Bath.

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*Shown on charts **105**, scale $\frac{1}{80,000}$, price $0.50; **314**, scale $\frac{1}{40,000}$, price $0.25; **315a**, scale $\frac{1}{20,000}$, price $0.20.

KENNEBEC RIVER.*

BATH, RICHMOND, GARDINER, HALLOWELL, AND AUGUSTA.

This river is one of the most important waterways on the coast of Maine, and is navigable to the city of Augusta, 40 miles above its entrance, for vessels of 10 feet draft. Vessels drawing 25 feet go to Bath, 12 miles above Pond Island. The river entrance, which is about 3¼ miles eastward of Cape Small, and 2 miles north of Seguin Island, is marked by **Pond Island Lighthouse** on its western side (see table, page 20). The river and entrance are somewhat obstructed by rocks and ledges, the principal ones being marked by buoys or spindles, and it has strong tidal currents. Strangers wishing to enter are advised to take a pilot or towboat near Seguin or Pond islands. Large vessels, when unable to get a pilot or towboat on account of unfavorable weather, sometimes make an anchorage in Boothbay Harbor and wait for a favorable wind to enter the Kennebec.

Stage Island Bay and **Sagadahoc Bay** form a shallow body of water extending in a northerly direction 1¾ miles from Salters Island on the east and Stage Island on the west. They are unfit for an anchorage, the northern part of Sagadahoc Bay being dry at low water.

Heals Eddy is a small, shallow cove making northward, west of Stage Island; the entrance is about **N.** by **E.** from Pond Island. Anchorage is found in places off the entrance between it and the Sugar Loaves, but strangers should not anchor here.

Hunniwells Point is a village, with several summer hotels, on the western point at the entrance of the river. A life-saving station is located on the beach eastward of the hotels; northward of the station is a landing and above the latter is **Fort Popham,** a large, granite structure. The beacon light and white fog-bell tower are located near the west edge of the channel southeastward of Fort Popham.

Atkins Bay is a shallow bight, almost entirely dry at low water, in the west bank, above Fort Popham.

Parkers Head Village is on the west bank, 2 miles above Fort Popham (see Anchorages).

Todds Bay is a shallow body of water eastward of the islands opposite Parkers Head Village; it runs dry at low water.

Back River, a crooked stream with narrow, shallow channel, makes into the eastern bank about 1¼ miles above Parkers Head. This river separates Georgetown and Arrowsic islands and enters the Sassanoa River at Hockomock Bay.

Phippsburg is a village on the west bank about 2 miles above Parkers Head; it has a shipyard for building wooden vessels.

Drummore Bay is a shallow bight west of Lees Island and north of Phippsburg.

Fishers Eddy is a small bight in the east bank about 2½ miles above Phippsburg. **Bluff Head** is on the western side of the bight; the full width of the river abreast Bluff Head is about 200 yards.

Fiddlers Reach is a sharp bend westward in the river about 1¼ miles above Fishers Eddy.

Winneganoe Creek is a broad, shallow creek emptying into the western end of Fiddlers Reach, where the river takes a sharp turn northward. The village of **Winneganoe** is situated on the western bank of the creek.

The city of **Bath** is on the west bank of the river 12 miles above Pond Island; one of its largest industries is shipbuilding. The deepest draft of vessels ascending to Bath is 25 feet, but a greater draft can be carried up at high water; there is 10 to 25 feet of water alongside the wharves.

Woolwich is a village on the east bank opposite Bath; a railroad ferry crosses the river from Bath to Woolwich.

Merrymeeting Bay is a large, shallow body of water making into the west bank of the river about 2¼ miles above Telegraph Point; the village of **Bowdoinham** is on its northern shore.

Richmond is a town on the west bank about 12 miles above Bath. The deepest draft of vessels loading here is 14 feet; vessels of 15 to 16 feet draft can come here when the river is high in the spring and fall; the depth alongside the wharves is 12 feet at low water.

The city of **Gardiner** is on the west bank of the river about 10 miles above Richmond. The deepest draft of vessels loading here is 16 to 17 feet during the spring and fall; 12 to 14 feet is the usual draft; there is 6 to 17 feet of water alongside the wharves at low water.

The village of **Randolph** is on the east bank of the river opposite Gardiner, and is connected with it by a drawbridge; the width of the draw, in the clear, is about 69 feet.

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*The entrance to Abagadasset Point is shown on charts **105**, scale $\frac{1}{80,000}$, price $0.50; **314**, scale $\frac{1}{40,000}$, price $0.25. The river from Abagadasset Point to Augusta is shown on two sheets: **316a** and **316b**, scale $\frac{1}{10,000}$, price of each $0.50.

Hallowell is a city on the west bank about 4 miles above Gardiner; the deepest draft that can be carried up to it is 10 feet.

Augusta, the capital of the State, is on the west bank of the river about 2 miles above Hallowell, and at the head of navigation and tide water. The deepest draft carried up to it is 10 feet.

The channels of the approach to the entrance are well marked; the eastern one has a least depth of 5½ fathoms between Pond Island and the Whales Back. The western channel has a depth of 4 to 5 fathoms on the sailing line. Above Fort Popham and up to Fiddlers Reach the least depth is 30 feet, and from thence to the city of Bath 28 feet. In several places islands and ledges contract the channel to a width of about 100 yards, and just eastward of Pettis Rocks, about ⅞ mile above Phippsburg, the channel is only 75 yards wide. The least water found on the middle ground just above Doubling Point is 3½ fathoms. Above Bath the channel is narrow and crooked in places, and about 3 miles below the town of Richmond it is divided by **Swan Island** (township of Perkins), which extends to the town of Richmond. The eastern channel along Swan Island is used by the deeper-draft vessels; it is being improved under the supervision of the U. S. Engineers. The western channel is sometimes used by steamers bound to Richmond and by light-draft vessels. At Richmond the channels unite, and above this it is narrow and has a number of dangerous ledges and shoals. Many of the dangers are marked by aids to navigation placed by the Government, and in difficult parts of the channel towboat captains have placed additional aids for their own use.

Anchorages.—The holding ground below Hunniwells Point at the entrance is poor, and vessels should not anchor unless forced to do so. If obliged to anchor when inside Pond Island, it is advisable to come-to in the channel abreast the life-saving station with a long scope of chain; if not blowing strong a moderate-sized vessel may ride here if care is taken to keep the anchor clear. The best anchorage is off Parkers Head Village, toward the eastern bank below Perkins Island; there is good anchorage here in 5 to 7 fathoms water, and drift ice coming down the river generally follows the western shore. Above Parkers Head Village vessels anchor wherever they can find good holding ground and suitable depth, keeping out of the strength of the current.

For **harbor regulations** for Bath see Appendix II.

For **quarantine regulations** see Appendix II.

Marine Hospital.—Relief is furnished at Bath by an acting assistant surgeon of the United States Public Health and Marine-Hospital Service, as for stations of Class IV. Patients requiring long-continued hospital treatment are sent to the Marine Hospital at Portland, Me. (See also Appendix IV.)

Pilots will come out to a vessel making signal when near Pond Island. There are several pilot lookouts at the entrance of the river; the principal lookout is on Cox Head, from which there is communication with the city of Bath by telephone. Strangers generally take a pilot, or, if a sailing vessel, a towboat. Strangers of over 17 feet draft should take a pilot. Under no circumstances should a stranger attempt to enter at night.

Towboats will generally be found off or just inside the entrance waiting to take vessels into the river. If one is not met outside they can be had by making signal when near Pond Island. Towboats will also be found at Bath to take vessels farther up the river.

Supplies.—Anthracite and bituminous coal can be obtained alongside wharves at Bath, and a limited quantity at Gardiner; anthracite coal can be had at Richmond. Fresh water can be had alongside the wharves at Bath, Richmond, and Gardiner; the water in the river is fresh at Richmond and above. Provisions and ship chandler's stores can be obtained at Bath, and provisions at the cities and towns on the river.

Repairs.—Bath has excellent facilities for repairing steel and wood vessels or the machinery of steamers. There are several large shipyards at which large steamers and sailing vessels are built. There is one marine railway capable of hauling out vessels of 1,000 tons.

Communication.—Bath and the principal cities and towns on the Kennebec River are on or near the line of the Maine Central Railway. The cities and towns on the river have communication with each other by steamer.

Freshets occur in March and April, also after heavy rains in the fall, but they are not dangerous to shipping unless accompanied by ice.

Ice usually closes the river to navigation above Bath from December to April. In severe winters the river may be closed below Bath for a limited period. Sailing vessels entering the river do so on the flood tide, and if unable to reach Bath on one tide, anchor below Perkins Island, on account of the drift ice which makes an anchorage in other parts of the river dangerous. Steamers, or vessels assisted by steam, are rarely delayed by ice.

The **tidal currents** have considerable velocity at the entrance and in the narrow parts of the river; some local knowledge of their set is necessary to insure safety to vessels under sail. The direction of the currents at the entrance is influenced by strong winds, especially easterly gales. During spring tides and freshets the

velocity of the ebb current is increased and requires special attention. No complete observations have been made to determine the set and velocity of the currents.

Tides.—The corrected establishment at Hunniwells Point is 11 hours 24 minutes. It is high water at Phippsburg about 5 minutes earlier, at Bath about 49 minutes later, at Bowdoinham about 2 hours 7 minutes later, and at Gardiner about 3 hours 14 minutes later than at Hunniwells Point (see also the table on page 27).

SAILING DIRECTIONS, KENNEBEC RIVER TO BATH.

Vessels approaching Kennebec River should have clear weather, and, if desiring to sail to the anchorage off Parkers Head Village, should have a strong fair wind when the tidal current is running ebb. No vessel can beat into the river against the current, and only small vessels attempt it even with a favorable current. In heavy weather vessels should anchor in Boothbay Harbor if eastward, or in Harpswell Harbor if westward; at such times, if the wind is opposed to the current, an ugly chop sea is encountered in the entrance. See "Pilots" and "Towboats" in the general information preceding. Vessels of over 18 feet draft should enter the river from eastward of Seguin Island.

1. ***Approaching and Entering, from Eastward alongshore.***—Having followed the directions for entering Boothbay Harbor from eastward, page 149, and when Ram Island Lighthouse bears *S.*, distant about 250 yards, steer **SW.** by **W.** ¼ **W.** and pass about 300 yards south of the bell buoy off The Cuckolds; Burnt Island Lighthouse will be sighted westward of Squirrel Island. With the bell buoy bearing *N.*, distant 300 yards, steer **W.** ¾ **S.**; pass about midway between The Black Rocks and The Sisters, keeping Whales Back, the eastern point at entrance to the river, on the starboard bow. Pass about 350 yards south of Whales Back, and then steer **NW.** by **W.** ½ **W.** for Pond Island Lighthouse. When the southern end of Pond Island is in range with the southern end of Wood Island, the island just westward, steer about **NNW.** ¾ **W.** and follow the directions in section 2.

Remarks.—On the **SW.** by **W.** ¼ **W.** course from Ram Island Lighthouse the fog-signal station on The Cuckolds will be on the starboard bow; Seguin Island will be seen in the distance on the starboard bow.

On the **W.** ¼ **S.** course Sheepscot River will be open northward. The course leads about midway between The Sisters, three low bare rocks, with a large tripod beacon on the westernmost, on the port hand, and The Black Rocks, two low bare rocks, and a third rock awash at high water, on the starboard hand. There is sometimes a strong current setting out of Sheepscot River. The **Whales Back**, a bare, rocky islet on the eastern side of the entrance to the river, and nearly ⅛ mile eastward of Pond Island, will be on the starboard bow. When nearly up to The Sisters, Pond Island Lighthouse will be seen between Salters Island and Whales Back, the latter showing southward of the lighthouse. On approaching Whales Back the hotels on the western side of the entrance will be seen, and Sagadahoc Bay and Heals Eddy will be opened westward of Whales Back. The fog-bell structure on Pond Island shows conspicuously on the eastern side of the island.

Dangers.—The Cuckolds, The Sisters, Toms Rock, and The Black Rocks are described on pages 153–154.

A **Shoal** extends about 100 yards southward from Whales Back. There is a spot with 19 feet over it about 400 yards **E.** from the southern end of Pond Island, on a line drawn from the southern end of Whales Back to the southern end of Pond Island.

Four Fathom Rock, with 3½ fathoms over it, lies 550 yards **E.** ½ **N.** from Pond Island Lighthouse; it is left on the starboard hand when entering.

1 A. ***Approaching and Entering, from Eastward.***—Passing about 2¼ miles south of Damiscove Island, bring Seguin Lighthouse to bear **W.** by **N.** and steer for it on this bearing, passing about ¾ mile north of the whistling buoy off Bantam Rock. When Pond Island Lighthouse bears **NW.** ¾ **W.** steer for it on this bearing, passing a little over ¼ mile southward of Toms Rock buoy, and about 400 yards northward of White Ledge buoy. When Whales Back is on the starboard beam steer **NW.** ¼ **W.** for the northern end of Pond Island, and when the southern end of Pond Island is in range with the southern end of Wood Island, the island just westward, steer about **NNW.** ¾ **W.** and follow the directions in section 2.

Remarks.—The **W.** by **N.** course leads south of all dangers, except the small ledge just northward of the whistling buoy off Bantam Rock, on which there is 4 fathoms.

On the **NW. ¾ W.** course for Pond Island Lighthouse the entrance of the river will be opened and Salters Island and Whales Back will be on the starboard bow. At low water several bare ledges will be seen northward of Seguin Island.

1 B. ***Approaching and Entering, from Southward, passing East of Seguin Island.***—Keep Seguin Lighthouse bearing westward of *N.* and steer northeastward, taking care to pass eastward of Mile Ledge and ¾ mile eastward of the lighthouse. When the lighthouse bears *W.* by *N.*, distant ¾ mile, steer **NNE.** until Pond Island Lighthouse bears **NW. ¾ W.** Steer for Pond Island Lighthouse on this bearing until Whales Back is on the starboard beam, distant nearly 450 yards, when steer **NW. ¼ W.** for the northern end of Pond Island. When the southern end of the island is in range with the southern end of Wood Island, the island just westward, steer about **NNW. ¾ W.** and follow the directions in section 2.

Remarks.—When Pond Island Lighthouse is made it should be brought to bear **NW. ¾ W.**, taking care, however, not to bring Seguin Lighthouse to bear southward of **SW.** before Pond Island Lighthouse is on the bearing. If Pond Island Lighthouse is brought on the bearing when it is about 3 miles distant, the **NW. ¾ W.** course will lead nearly ⅝ mile south of Toms Rock buoy; the hotels on the western side of the entrance will be seen over Pond Island and northward of it. When Whales Back is nearly abeam, **Fort Popham,** a granite structure, and the beacon light and fog-bell tower will be opened westward of the Sugar Loaf Islands.

Dangers.—**Toms Rock** and **The Sisters** are described on page 154.

Mile Ledge is described on page 154. If passing between the ledge and the southern end of Seguin Island give Mile Ledge buoy a berth of 500 yards.

Ledges make out over ¼ mile in places from the eastern shore of Seguin; to avoid them give the eastern shore of the island a berth of at least ⅝ mile.

Seguin Ledges, some showing bare, lie about ⅝ mile **NE.** by **N.** from the northern end of Seguin Island. The bare heads of the ledges are surrounded by shoal water, and should be given a berth of over 300 yards.

White Ledge has a least depth of 6 feet over it and lies 1 mile **NE.** by **N.** from the northern end of Seguin, and about 1 mile **SE. ¾ S.** from Pond Island Lighthouse. A buoy (spar, black, No. 1) is placed about 20 yards **E.** from the shoal part of the ledge. Vessels should not pass between this ledge and Seguin Ledges.

Four Fathom Rock and the 19-foot spot eastward of Pond Island are described under section 1, preceding.

1 C. ***Approaching and Entering, from Westward.***—Steer for Seguin Lighthouse on any bearing between **N.** by **E. ½ E.** and **E. ½ N.**, and pass about ½ mile westward of the island. When Seguin Lighthouse bears *E.*, distant ½ mile, steer **NNE. ½ E.** for Whales Back, and leave the bell buoy on Pond Island Bar about 400 yards on the port beam. When the southern end of Wood Island (the island just westward of Pond Island) bears on the port beam, steer **N.** by **W. ¼ W.** until the southern end of Pond Island is in range with the southern end of Wood Island. Then change course to **NNW. ¾ W.**, and follow the directions in section 2.

Remarks.—Approaching Seguin Lighthouse between the above bearings all the dangers off Small Point are avoided; Pond Island and lighthouse will be seen on the port bow 2 miles northward of Seguin. About 2½ miles **SSW. ¾ W.** from Seguin Lighthouse is a small 6-fathom spot known as **Seguin SSW. Ledge;** a red whistling buoy is moored about ⅝ mile northwestward from this spot. As the western side of Seguin Island is approached Ellingwood Rock and Seguin Ledges, lying northward and northeastward, will be seen, with the sea usually breaking over the latter.

On the **NNE. ½ E.** course Ellingwood Rock and Seguin Ledges are left ¼ mile or more on the starboard hand; Whales Back will be ahead, and the bell buoy on the port bow. When the bell buoy is abaft the beam and the course has been changed to **N.** by **W. ¼ W.**, the northern end of South Sugar Loaf Island will be ahead, and Fort Popham will be opened northward of Pond Island.

Dangers.—**Fullers,** or **Glovers, Rock** is a bare rocky islet about ¼ mile **S.** from Small Point. **Bill Wallaces Ground,** with a depth of 18 feet, lies nearly ½ mile west from Fullers Rock and is not marked. **Button Mould Ledges** with a depth of 11 and 16 feet, lie a little over ⅛ mile northwestward of Fullers Rock, in the passage between the latter and Small Point. These dangers are surrounded by deep water, but it is not advisable to pass Small Point closer than ⅝ mile.

Halibut Rocks have a least depth of 4½ fathoms over them and lie ½ mile **E. ½ S.** from Fullers Rock; they are not marked, and are avoided by keeping Seguin Lighthouse bearing northward of **E. ½ N.**

Northward of the sailing line between Cape Small and Pond Island are a number of **small islands** and **sunken rocks** and **shoals. Jack Knife Ledge,** the farthest offshore, has a least depth of 8 feet, and lies 1½ miles **SW. ½ S.** from Pond Island Lighthouse; it is marked by a buoy (can, black, "J. K." in white letters) placed southward of the shoalest part of the ledge. Vessels should not pass northward of this buoy.

Ellingwood Rock, large and bare, lies about 400 yards **N.** from the northern end of Seguin; it should not be approached closer than 150 yards from westward.

Seguin Ledges and **White Ledge** are described under section 1 B; they are left on the starboard hand by vessels entering from westward, and should not be approached nearer than 400 yards.

Pond Island Bar is the name given to the shoal which lies southward and southwestward of Pond Island. It has depths ranging from 5 to 21 feet over it, and in heavy gales is covered with breakers. A buoy (bell, black) marks the southeastern end of the bar and bears **S.,** distant ⅝ mile from Pond Island Lighthouse. Vessels should not pass between this buoy and Pond Island.

A spot with 22 feet of water over it lies on the eastern side of the sailing line, ⅝ mile **SE. ½ S.** from Pond Island Lighthouse.

Four Fathom Rock and the 19-foot spot east of Pond Island are described under section 1, preceding.

2. ***From Pond Island to the anchorage off Parkers Head Village.***—When the southern end of Pond Island is distant about ¼ mile and in range with the southern end of Wood Island, the island just westward, steer about **NNW. ¾ W.,** leaving Pond Island Rock buoy on the port hand and passing about 150 yards westward of South Sugar Loaf; then bring Pond Island Lighthouse to bear *S.* by *E.* astern, and steer **N.** by **W.,** keeping the bearing. Leave North Sugar Loaf Island 150 yards on the starboard hand, and pass about 80 yards eastward of the beacon light and fog-bell tower, and about 150 yards eastward of Fort Popham; then steer about **N.** for the eastern edge of Cox Head, leaving Shag Rock beacon about 200 yards on the starboard hand. Leave Cox Head about 150 yards on the port hand, steer about **N. ¾ E.,** and follow the directions in section 3.

Or, when on the **N. ¾ E.** course anchor on the eastern side of the channel in 6 to 7 fathoms water, south of Perkins Island South Ledge buoy (spar, red and black horizontal stripes), about ½ mile above Cox Head.

Caution.—The velocity of the tidal currents above Pond Island is considerable, especially the ebb during spring tides and freshets. The courses are affected to such a degree by the currents that it is advisable for strangers in sailing vessels to take a pilot or towboat at Pond Island.

Remarks.—On the **NNW. ¾ W.** course Fort Popham will be a little on the starboard bow and the steamboat landing on Hunniwells Beach a little on the port bow. The **South Sugar Loaf,** a bare, rocky islet, will be left on the starboard hand.

On the **N.** by **W.** course, with Pond Island Lighthouse astern, Fort Popham will be on the port bow and Gilberts Head, on the east side of the entrance, will be on the starboard bow. **North Sugar Loaf,** a bare, rocky islet, should be left at least 150 yards on the starboard hand. The sailing line leads about midway between Fort Popham and Gilberts Head.

On the **N.** course, when heading for the eastern end of Cox Head, **Shag Rock** beacon will be on the starboard bow, and is left 200 yards on the starboard hand. After passing this rock the course is a little more eastward, heading for Perkins Island South Ledge buoy. The water shoals abruptly from 4 fathoms to 6 feet on the eastern side of the channel at the anchorage south of Perkins Island.

Dangers.—**Pond Island Rock,** with 18 feet of water over it, lies 400 yards **N.** by **E. ½ E.** from Pond Island Lighthouse; it is marked by a buoy (spar, red and black horizontal stripes) placed near the rock, and which should be left on the port hand when entering. There is deep water around the rock, but a ledge makes out about 50 yards northward from the northern end of Pond Island.

Ledges make off about 100 yards southward and eastward from South Sugar Loaf. **Jack Rock,** off the northeastern side of the islet, is marked by a spindle (iron, black, cage on top).

Ledges make off about 175 yards southward from North Sugar Loaf, and about 125 yards northwestward from it.

The water shoals abruptly on the western side of the channel when approaching the beach, which is hard sand.

The bight between Hunniwells Point and Cox Head is full of flats, which are mostly bare at low water.

Shag Rock is a small, bare rock on the eastern side of the channel ¼ mile **SE.** by **S.** from Cox Head. The rock is nearer the southern end of the ledge which surrounds it and is 250 yards long in a **N.** and **S.** direction, and about 80 yards wide, and is marked by a large tripod beacon.

Perkins Island Ledges are two rocks lying in the channel southward and westward of Perkins Island. **Perkins Island South Ledge** has a depth of 11 feet over it, and lies in mid-channel about ¼ mile below Perkins Island; it is marked by a buoy (spar, red and black horizontal stripes) placed southward of the ledge. **Perkins Island North Ledge** is in mid-channel west of Perkins Island; it has 7 feet of water over it and is marked by a buoy (can, black, No. 1) placed southeast from its shoalest part.

A **shoal** makes out about 250 yards southward from Perkins Island. Between this and Perkins Island South Ledge there is a channel about 200 yards wide.

The bight in the west bank southward of Parkers Head is full of flats, mostly bare at low water. A narrow channel, with about 9 feet of water, leads from the deep water of the river to Parkers Head Village.

3. ***From Parkers Head Village to Bath.***—Leaving Cox Head 150 yards on the port hand, the **N.** ¾ **E.** course leads for the red and black horizontally striped spar buoy on Perkins Island South Ledge. Leave this buoy 75 yards on the starboard hand, and then steer a little more eastward so as to pass midway between Perkins Island Lighthouse and black can buoy No. 1, which is about 200 yards westward of the island. When past Perkins Island bring the lighthouse to bear *S.* ¾ *W.* and steer **N.** ¾ **E.**, heading for *Bald Head*, the western point at the entrance to Back River.

When Bald Head is ⅝ mile distant ahead, steer about **NNW.** ½ **W.**, keeping Squirrel Point Lighthouse (see table, page 20) a little on the starboard bow, and leaving the piles with kegs on top (perches), which mark the flats, well on the starboard hand. Round Squirrel Point at a distance of 175 yards and steer about **NNE.** for ½ mile. When about midway between the point on the eastern bank and black spar buoy No. 3, and the black spindle on Pettis Rocks is ¼ mile distant a little on the starboard bow, haul eastward a little so as to pass midway between the spindle and the eastern bank of the river, and follow the eastern bank, keeping midway between it and the bare rock and island northward of the spindle; the channel is narrow from Pettis Rocks to Ram Island.

Pass about 150 yards eastward of the black tripod beacon on Ram Island, and steer about **N.** by **E.** ½ **E.** for Bluff Head; pass Indian Point beacon (white) and give the western bank a berth of 250 yards. When Bluff Head is about 400 yards distant haul a little northward so as to leave it 75 yards on the starboard hand, and then follow a mid-river course for about 1 mile above Bluff Head until nearly up with black spar buoy No. 5. Then bring the vessel on the Doubling Point Range (two white pyramidal towers) and head up on the range, course **N.** by **E.** ¼ **E.** Leave black spar buoys No. 5 and No. 7 each about 30 yards on the port hand, and when the latter has been passed haul westward into Fiddlers Reach, keeping midway between the banks.

Round Doubling Point Lighthouse (see table, page 20), giving it a berth of 200 yards on the starboard hand, and then steer about **N.** by **E.** ⅛ **E.** Having stood on this course a little over ¾ mile, black spar buoy No. 11 should be left 125 yards on the port hand, and having stood ¼ mile farther, black spar buoy No. 13 should be left 200 yards on the port hand. Anchor about ¼ mile above the latter buoy, or, continue up the river in midstream and anchor southward of red spar buoy No. 2, within the limits prescribed by the regulations in Appendix II.

Remarks.—The tidal currents have considerable velocity and care must be taken not to set off the courses.

The dangers near Perkins Island are described under section 2. The dangers above Perkins Island will be avoided by a close attention to the directions. A middle ground of sawdust has formed in the channel just above Doubling Point. The least depth over this shoal, in 1902, was 3½ fathoms.

CASCO BAY.*

This bay lies between and northward of Cape Small on the east and Cape Elizabeth on the west, between which points it is 17 miles wide and extends northward about 12 miles. The shores present a very irregular outline, being indented by numerous sounds, bays, rivers, and coves, separated by islands and much obstructed

*Shown on charts **106, 107,** scale $\frac{1}{80,000}$, price of each $0.50; **315,** scale $\frac{1}{40,000}$, price $0.25.

by rocks and ledges; the general trend of the islands and indentations is about **NE.** and **SW.** Portland Harbor, in the western shore, has a large foreign and coastwise trade (see heading, "Portland Harbor"); the other waters are mostly frequented by fishermen and small vessels plying from Portland to the towns and villages on the islands and shores of the bay. Small steamers from Portland run as far east as Orrs Island, in Harpswell Sound, stopping at intermediate landings among the islands and at Potts Harbor. The part of Casco Bay between Cape Small and the entrance of Mericoneag Sound is full of small islands and dangerous ledges and rocks, between which narrow but deep channels lead to the waters northward. Strangers should not attempt to enter this part of the bay without a pilot.

Westward of Mericoneag Sound the channels leading into the bay are broader and have fewer obstructions, the most dangerous of which are marked by buoys or spindles. Strangers can easily avoid these dangers by using the chart and by closely following the directions in this volume. **Seguin Lighthouse** (see table, page 20) is 3½ miles east of **Cape Small**, the eastern point at the entrance to the bay, and is a guide to it from eastward. **Halfway Rock Lighthouse** (see table, page 20) lies about in the middle of the entrance to the bay. **Cape Elizabeth lighthouses, Portland Head Lighthouse, Spring Point Ledge Lighthouse,** and **Portland Breakwater Lighthouse** (see table, page 20) are on the western shore of the bay and are guides for Portland Harbor,* and Cape Elizabeth Light-vessel is off the entrance to the harbor. Strangers bound into Casco Bay generally take a pilot, usually some fisherman found off the entrance; the only regular pilots in this vicinity are for Portland Harbor.

Small Point Harbor is on the western shore of Cape Small, about 2 miles northward of **Bald Head**, the southwestern point of Cape Small; it lies eastward of Wood Island and is open southwestward. It is seldom used as an anchorage except by fishermen; the principal dangers are marked, but the holding ground is poor. The village of **Small Point** is at the head of the harbor.

Watering (Carrying) Place Cove is a small bight eastward of Burnt Coat Island, in the western shore of Cape Small, a little over 2¾ miles northward of Bald Head. It has a narrow channel with a least depth of 19 feet at low water, marked by three buoys. There is an ice wharf and store on the eastern shore of the bight where vessels load ice.

Horse Island Harbor is a small but good anchorage, with 8 to 30 feet of water, on the eastern shore of the bay, about 3½ miles north of Bald Head; it lies between Horse Island and the mainland and is frequently used as a harbor of refuge by small craft.

New Meadows River is described under a separate heading.

Ridleys Cove is eastward of Yarmouth Island and just westward of the entrance to New Meadows River. It has good anchorage in 5 to 7 fathoms water but is exposed to southerly and southwesterly winds. Strangers should not attempt to enter without a pilot on account of numerous unmarked ledges and rocks which lie off the entrance. There is a narrow deep channel leading from its northern end into Hen Cove and Quohog Bay.

Hen Cove is north of Ridleys Cove, and on the eastern side of Quohog Bay.

Quohog Bay is a narrow arm extending about 4 miles in a **NE.** by **N.** direction; it is seldom entered by strangers. Numerous unmarked ledges and many small islands lie off its entrance, which is between Yarmouth Island and ledges on the east, and Long Point on the west, and lies 5 miles **NNW.** ¾ **W.** from Bald Head.

The Gurnet is an unimportant arm making in 2 miles **NE.** by **E.** on the east side of Orrs Island and just westward of Quohog Bay; it is only used by fishermen and a few vessels, of 12 to 14 feet draft, that load ice near its head.

Lowells Cove is a small cove in the southern end of Orrs Island and west of The Gurnet. **Horse Cove** is a small cove in the north shore of Baileys Island.

Mericoneag Sound, Harpswell Sound, and **Potts Harbor** are described under separate headings.

Broad Sound is one of the approaches to Potts Harbor from southward and westward, and the eastern approach to the part of Casco Bay lying west of Harpswell Neck and including the towns of Freeport and Yarmouth; it is also the eastern entrance to the inside passage to Portland. The entrance to the sound is between Eagle Island and West Brown Cow, and lies 3 miles **N.** ¼ **W.** from Halfway Rock Lighthouse; its general direction is about **N.** by **E.** between the islands. The least water in the channel up to Whaleboat Island is 11 fathoms.

Middle Bay is described under a separate heading.

Mare Point Bay, shallow and obstructed by flats, lies between Birch and Whites islands on the east and Mare Point Neck on the west, and is separated from the upper part of Middle Bay by the two islands. There is a steamboat landing on the eastern side of Mare Point Neck near its southern end.

* A lighthouse is to be erected on Ram Island at the eastern side of the entrance to Portland Harbor.

Maquoit Bay makes northeastward on the western side of Mare Point Neck, the entrance lying north of the Goose Islands. It is obstructed by flats, with 1 to 4 feet of water over them, through which a channel with 19 to 24 feet water leads for a distance of 2¼ miles from its entrance.

Freeport (Harrasseeket) River and **Yarmouth River** are described under separate headings.

Luckses Sound is an approach from westward to Potts Harbor, Middle, Mare Point, and Maquoit bays, and to the town of Freeport; it leads northeastward between Crotch Island on the east and Long and Hope islands on the west. The channel is well defined and can be easily followed; there are few unmarked dangers. The entrance lies 7¼ miles **NE. ½ N.** from Cape Elizabeth Lighthouses and just northward of Outer Green Island and Junk of Pork Rock.

Chandlers Cove is formed by a bight in the southwestern end of Great Chebeag Island and by Little Chebeag Island; it is a good anchorage, with 5 to 10 fathoms water, but is little used. The entrance from eastward is through Luckses Sound and between the northeastern point of Long Island and **Deer Point**, the southern point of Great Chebeag Island. The western entrance, between the north end of Long Island and the south end of Little Chebeag Island, is somewhat obstructed by rocks, which are marked by buoys.

Broad Cove is a large shallow cove in the northwestern part of Casco Bay; there is good anchorage in the middle of the cove, southwest of Princes Point, in 15 to 17 feet of water; it is open southward and eastward. There is a steamboat landing at Princes Point.

Mussel Cove is a small shallow cove in the western shore of the bay about 2 miles southwestward of Broad Cove. There are two steamboat landings on the west shore of the bay northward of the cove.

Husseys Sound is one of the principal channels into the western part of Casco Bay; it leads from southward between Long Island on the east and Peaks Island and Great Diamond Island on the west. The least water in this sound is about 11 fathoms, with the exception of one small spot about midway between Long and Peaks islands, where there is 28 feet with deep water all around it.

Presumpscot River, on the western shore of the bay, is north of the city of Portland. Its entrance is between Mackeys Point on the east and Martins Point on the west; the **United States Marine Hospital** is situated on the latter point. The channel is narrow, crooked, and shallow, and is crossed by a bridge from Mackeys Point to Martins Point. Vessels passing up the river take a towboat at Portland.

Anchorages.—In the eastern part of Casco Bay, the best anchorage for strangers is in New Meadows River (see heading). Local fishermen frequently use Horse Island and Cundy harbors. Potts Harbor, Harpswell Harbor, and Mackerel Cove are good anchorages in the middle of the bay for small vessels and yachts. Mericoneag Sound and Harpswell Sound and the whole of Casco Bay westward of Harpswell Neck afford good anchorage for large vessels except in heavy northeast gales. Vessels enter through Broad Sound, Luckses Sound, or Husseys Sound, and select an anchorage under the lee of some of the many islands, a suitable depth and good holding ground being found in most places. Directions for Broad Sound and Luckses Sound are given under Freeport River, and for Husseys Sound under Yarmouth River. Portland Harbor affords a secure anchorage on the western side of the bay.

Pilots.—Strangers bound into Casco Bay and the adjoining waters generally take a pilot, usually some fisherman found off the islands. Vessels from eastward sometimes signal off Small Point Harbor for a pilot; one can always be had there for the waters northeastward of Halfway Rock. Vessels from westward take a pilot off Portland, or, standing into Husseys or Luckses Sounds, take one from some one of the islands in the bay if a fisherman is not found outside.

Towboats.—Vessels bound into the bay, when coming from eastward, sometimes take a towboat near Seguin Island, or, when coming from westward, take one off Portland Harbor. They can usually be found in the mouth of the Kennebec River and off Portland Head.

Supplies.—Provisions can be obtained at Small Point Harbor, Cundy Harbor, Potts Harbor, and Freeport. Water has to be taken in casks from wells or ice ponds. See also Portland Harbor.

Repairs.—There are no facilities for repairing vessels except at Portland (see heading "Portland Harbor").

Ice.—Considerable ice forms at the heads of the numerous arms extending northward in Casco Bay, but the principal anchorages are available at any season of the year.

Currents.—The tidal currents are not strong, but on the flood there is a perceptible set northward and on the ebb southward in the bay and across the entrance.

Tides.—The mean rise and fall of tides in the bay is about 9 feet (see table, page 27).

SAILING DIRECTIONS, CROSSING CASCO BAY OUTSIDE OF HALFWAY ROCK TO PORTLAND HARBOR ENTRANCE.

1. *From Eastward.*—From a position about ½ mile southward of Bantam Rock red whistling buoy steer **W. ½ N.** about 24½ miles, passing about 1¾ miles southward of Seguin Lighthouse. Leave Small Point about 1¾ miles on the starboard hand and pass about ⅝ mile southward of Halfway Rock Lighthouse, and between it and the red whistling buoy; Portland Head Lighthouse should be made ahead. Pass nearly ¼ mile north of Witch Rock lighted buoy, and about ¼ mile southward of Ram Island Ledge tripod (wooden, red, 50 feet high, partly boarded), and when the beacon bears *NE.*, steer **NW.** by **W.** and follow the directions in sections 1 and 2 "Sailing Directions, Portland Harbor."

Remarks.—On the **W. ½ N.** course Mile Ledge buoy (can, red and black horizontal stripes) will be made a little on the starboard bow and left about ¾ mile on the starboard hand when south of Seguin Island, and Seguin Island whistling buoy will be left about ¼ mile on the port hand.

Lumbo Ledge buoy (spar, red and black horizontal stripes) will be made on the starboard bow and left about 1¼ miles on the starboard hand when about 4½ miles westward of Small Point. Halfway Rock Lighthouse will be made a little on the starboard bow, and the red whistling buoy on the port bow. When westward of Halfway Rock, **Outer Green Island**, small, bare, grassy island, and **Junk of Pork**, small bare rock, will be made on the starboard bow and left about ¾ mile distant. Witch Rock buoy (gas-lighted, red, "W. R." in white letters) will be made a little on the port bow, and left about ¼ mile on the port hand. Ram Island Ledge Tripod* will be made on the starboard bow, and left about ¼ mile on the starboard hand.

At night Seguin Light should be on the starboard bow when abreast the whistling buoy off Bantam Rock, and Pond Island Light will be seen northward of Seguin. Halfway Rock Light should be made a little on the starboard bow when Seguin Light bears about **NW.** When abreast Cape Small, Cape Elizabeth Lights should be made on the port bow, and shortly afterwards Portland Head Light should be made ahead and southward of Halfway Rock Light. Seguin Light should be in sight on the starboard quarter until nearly up to Portland Head.

Dangers.—**Mile Ledge**, with 10 feet of water on it, lies ⅞ mile **S. ¾ W.** from Seguin Island Lighthouse; it is marked on its southern side by a buoy (can, red and black horizontal stripes). There is a passage with good water between the ledge and Seguin Island by giving the buoy a berth of 500 yards.

Flat Ground, or **Temples Ledge**, has a least depth of 5 fathoms on it and lies 1¼ to 1¾ miles **SW. ¾ W.** from Bald Head and about 2¼ miles **W. ½ S.** from Fullers Rock; it can be avoided by keeping Halfway Rock Lighthouse bearing northward of **W. ½ N.** The sea breaks on this ledge in heavy weather.

Lumbo Ledge is about ⅞ mile long in a general **ENE.** and **WSW.** direction, and lies just northward and nearly midway on a line from Small Point to Halfway Rock. At its southwestern end is a spot with 9 feet over it, marked by a buoy (spar, red and black horizontal stripes), which bears **E. ¼ N.** about 4¾ miles from Halfway Rock Lighthouse. The depths on the ledge northeastward of the buoy range from 5 to 13¼ fathoms.

Round Shoal, with 4¾ fathoms on it, is the shoalest part of East Cod Ledge, and lies near its northern end, 3¼ miles **S.** by **W. ½ W.** from Halfway Rock Lighthouse, and about 1 mile **E. ¾ S.** from Bulwark Shoal buoy.

Bulwark Shoal, with 14 feet on it, and lying 3¼ miles **SW. ½ S.** from Halfway Rock Lighthouse, is marked on its southeastern side by a buoy (nun, red and black horizontal stripes). Round Shoal, Bulwark Shoal, and the rocks and shoals lying southwestward of them can be avoided by keeping Portland Head Lighthouse bearing westward of **WNW.**

Outer Green Island, Junk of Pork, and the rocks and reefs northward and eastward of them can be avoided by keeping Portland Head Lighthouse bearing westward and northward of **W. ¼ S.**

Witch Rock, with 4 fathoms on it, is marked by a buoy (gas-lighted, red, "W. R." in white letters) placed 100 yards southeast of the rock and lying 1⅝ miles **E.** by **S.** from Portland Head Lighthouse. See also "Dangers," section 1, "Sailing Directions, Portland Harbor."

Ram Island Ledge, bare at low water, makes in a southerly direction for a little over ¼ mile from Ram Island. It is marked on its southern end by a beacon (wooden tripod, 50 feet high, partly boarded from the top), which bears **ENE. ½ E.**, distant 1 mile from Portland Head Lighthouse.

Jordan Reef, with 22 feet of water on it, lies 1 mile **SE.** by **E.** from Portland Head Lighthouse, and is marked by a buoy (nun, red and black horizontal stripes) placed 50 yards southeast of the reef.

SAILING DIRECTIONS, CROSSING CASCO BAY INSIDE THE ISLANDS.

The following directions, if closely followed, are good for a draft of 12 feet. A draft of 20 feet may be taken into Portland Harbor inside of the islands, but some local knowledge and a favorable tide are necessary. Strangers should only use this passage in the daytime with clear weather.

* A lighthouse is to be erected on Ram Island at the eastern side of the entrance to Portland Harbor.

1. *From Eastward.*—From a position about $\frac{7}{8}$ mile *S.* of Small Point, the southern end of Cape Small, steer **NW.** by **W.** $\frac{3}{4}$ **W.** for Little Mark Island monument (square stone tower, 50 feet high, black and white perpendicular stripes). When about $\frac{1}{2}$ mile from the monument haul northward a little, then steer **WNW.**, and pass about 225 yards north of the monument. Leave red spar buoy No. 4 on the starboard hand, and steer about **NW.** $\frac{1}{2}$ **N.**, so as to leave black spar buoy No. 3 on the port hand. Continue the **NW.** $\frac{1}{2}$ **N.** course until the northern end of Eagle Island is abeam, then steer **NW.** $\frac{3}{4}$ **W.** Leave Stave Island Ledge buoy (spar, black, No. 5) about 50 yards on the port hand, and when it bears *S.* steer **W.** $\frac{1}{4}$ **S.** for Sand Island Ledge buoy (spar, black, No. 7). Pass about 250 yards southward of Little Bangs Island and 50 yards northward of black spar buoy No. 7. Continue the **W.** $\frac{1}{4}$ **S.** course about 250 yards beyond buoy No. 7, and then steer **WSW.** for the northeastern end of Long Island, and proceed as directed in section 2, following.

Remarks and dangers.—When south of Small Point, Fullers or Glovers Rock will be in range with it, and distant about $\frac{5}{8}$ mile.

On the **NW.** by **W.** $\frac{3}{4}$ **W.** course Lumbo Ledge buoy (spar, red and black horizontal stripes) will be left about 1 mile on the port hand. **Jaquish Island,** bare, the southernmost of the islands at the eastern side of the entrance to Mericoneag Sound, with bare, rocky ledges lying about 150 yards southward and eastward of it, will be made on the starboard bow and left $\frac{3}{8}$ mile on the starboard hand. **Turnip Island,** small and bare, will be opened northward and westward of Jaquish Island. Turnip Island Ledge buoy (spar, red, No. 2) will be left $\frac{1}{4}$ mile on the starboard hand. Mark Island Ledge buoy (spar, black, No. 1) will be on the port bow, and left about $\frac{3}{8}$ mile on the port hand. When abreast this buoy Mericoneag and Harpswell sounds will be open northward.

Bill Wallaces Ground, with 18 feet on it, **Button Mould Ledges,** with 11 feet on them, **Bald Head Ledge,** bare at half tide and marked by a red iron spindle, lie $\frac{3}{8}$ to $\frac{1}{2}$ mile southward of Cape Small and westward of Fullers Rock. They can be avoided by giving the shores of Cape Small a berth of at least $\frac{5}{8}$ mile.

Flat Ground or **Temples Ledge** and **Lumbo Ledge** are described on page 165.

E. Brown Cow is a small, bare island, bold-to on all except its northern side, lying $1\frac{1}{2}$ miles **WNW.** $\frac{1}{2}$ **W.** from Bald Head. The **NW.** by **W.** $\frac{3}{4}$ **W.** course leads $\frac{7}{8}$ mile southward of it.

Bold Dick is a small, bare rock, with good water 200 yards from it on all sides; it lies $2\frac{1}{8}$ miles **WNW.** from E. Brown Cow.

Saddleback Ledge and **Round Rock,** unmarked ledges awash at low water, lie from $\frac{1}{4}$ to $\frac{7}{8}$ mile northward and northwestward of Bold Dick.

Jaquish Island has ledges and bare rocks making out about 350 yards southward and southeastward from it; they may be avoided by keeping Little Mark Island monument bearing northward of **WNW.** $\frac{1}{2}$ **W.**

An unmarked **16-foot** spot lies $\frac{3}{4}$ mile **SSW.** $\frac{1}{4}$ **W.** from the southwestern end of Jaquish Island. It can be avoided by keeping Little Mark Island monument bearing westward of **NW.** by **W.** There is a 19-foot spot 550 yards **S.** by **W.** from the southern end of Jaquish Island, and between this and the 16-foot spot are two spots with 24 and 27 feet over them.

Turnip Island Ledge, bare at low water, lies $\frac{3}{4}$ mile **E.** $\frac{1}{4}$ **S.** from Little Mark Island monument. It is marked on its southwestern side by a buoy (spar, red, No. 2).

Mark Island Ledge, a detached ledge with 3 feet of water on it, lies $\frac{3}{4}$ mile **SSE.** $\frac{3}{4}$ **E.** from Little Mark Island monument. It is marked on its western side by a buoy (spar, black, No. 1). The ledge is about 300 yards long **N.** and **S.** and about 200 yards wide.

On the **WNW.** course, passing north of Little Mark Island, **Haddock Rock,** a rocky islet surrounded by ledges, will be ahead, and **Eagle Island,** surrounded by ledges and thickly wooded, will be on the port bow.

Ledges make off about 100 yards northward from Little Mark Island, and about 300 southwestward from **Great Mark Island**—the small island $\frac{3}{8}$ mile **NE.** by **N.** from the monument. The channel between these ledges is about 250 yards wide.

Ledges make off about 200 yards southward and westward from the southern point of Haskell Island. They are marked near their southern edge by a buoy (spar, red, No. 4).

The **NW.** $\frac{1}{2}$ **N.** course leads about 200 yards northeastward of Haddock Rock, and about 600 yards northward of Eagle Island.

Haddock Rock is surrounded by ledges which are marked at their northeastern edge by a buoy (spar, black, No. 3).

Ledges obstruct the opening to Potts Harbor between Haskell and Upper Flag islands.

Ledges make off 350 yards northeastward from Eagle Island, and about the same distance southwestward from Upper Flag Island, leaving the channel between these islands about $\frac{1}{4}$ mile wide.

On the **NW.** $\frac{3}{4}$ **W.** course **Bates** and **Ministerial islands,** mostly bare, will be on the port bow, and the western entrance to Potts Harbor, marked on its southern side by a red and black horizontally striped spar buoy and

on its northern side by a red bell buoy, will be opened out on the starboard beam; Little Bangs Island will be ahead, and Stave Island Ledge buoy should be a little on the port bow.

Stave Island Ledge, bare in places at low water, extends ¼ mile **NE.** from the long, rocky point on the northeastern end of Stave Island. It is marked on its end by a buoy (spar, black, No. 5).

On the **W. ¼ S.** course black spar buoy No. 7 will be a little on the port bow. **Little Bangs Island**, with a rocky bluff about 20 feet high and a few straggling trees on its southwest end, will be on the starboard bow and left about 250 yards on the starboard hand.

Sand Island Ledge extends ¼ mile **NE.** from Sand Island. It is marked on its northern end by a buoy (spar, black, No. 7). There is no safe passage between the buoy and the island.

2. ***From the Northeastern end of Long Island to Portland.***—After having passed 250 yards beyond black buoy No. 7, steer **WSW.** for the northeastern end of Long Island, giving Deer Point a berth of 200 yards, and Deer Point Rock buoy a berth of 100 yards on the starboard hand. When about 150 yards westward of the buoy, steer **N. ¾ E.** into Chandlers Cove. Leave Crow Island, low, grassy, with a few bunched trees, about 250 yards on the port hand, and steer **W. ½ N.** for the southern end of Little Chebeag Island; when the island is about 400 yards distant, steer **SW.** by **W.**, passing about midway between Little Chebeag and Long islands. Leave red spar buoy No. 10 about 100 yards on the starboard hand and pass southward of red spar buoy No. 12, giving it a berth of 50 yards, then steer **W. ¼ S.** Pass about 200 yards northward of Cow Island, and 300 yards northward of red spar buoy No. 4, marking Brimstone Point Ledge. When this buoy bears *SE.*, distant about 400 yards, steer **SW. ⅛ W.** for the breakwater Lighthouse, and pass close westward of red spar buoy No. 2; when Fort Gorges bears *SE.* haul westward and stand in for Portland Upper Harbor, giving the wharves a berth of 200 yards. Anchor on the eastern edge of the channel, within the limits prescribed in the harbor regulations in Appendix II.

Remarks.—On the **WSW.** course red spar buoy No. 8, marking Sand Point, will be left about 250 yards on the starboard hand. Hope Island, which is left on the port hand, is fairly bold-to, and may be approached to 150 yards. The shore from Colemans Cove to **Deer Point**, the southern point of Great Chebeag Island, is bold-to, and may be approached to 100 yards. The northeastern point of **Long Island** is low, grassy, with a water line of whitish rocks; it is backed by a thick growth of trees; the end may be approached to 100 yards, but northward of this point shoals make out and connect Long Island with Crow Island. The horizontally striped buoy on Deer Point Rock must be given a good berth as the buoy lies southeastward of the rock. Standing for Little Chebeag Island, give Crow Island a berth of at least 150 yards. The northern end of Long Island should be given a berth of 150 yards. The western shore of Long Island should not be approached closer than 250 yards when southward of red buoy No. 12.

On the **W. ¼ S.** course Cow Island Ledge spindle (iron, black, cage on top) will be made on the starboard bow, and left about ½ mile on the starboard hand. **Cow Island** will be a little on the port bow; it is comparatively bold-to on its northern side, and may be approached to 150 yards. When abreast of Cow Island, Hog Island Ledge buoy (spar, red, No. 6), marking the western side of Cow Island Channel will be opened out and left about ¼ mile on the port hand.

On the **SW. ⅛ W.** course, after passing red buoy No. 2, care should be taken not to let the Breakwater light bear southward of **SW. ⅛ W.**

Dangers.—**Sand Point**, a point on the southeastern shore of Great Chebeag Island, bearing **WNW.** from the northern end of Sand Island, has a shoal with 3 feet over it, extending 150 yards southeastward. The eastern side of this shoal is marked by a buoy (spar, red, No. 8).

Deer Point Rock is small with 4½ feet of water over it, lying 250 yards **SW.** by **W.** from the southern end of Deer Point. There is a passage with 4¾ fathoms between the rock and Deer Point by giving the latter a berth of 150 yards. Strangers are advised to pass southward and westward of the buoy (spar, red and black horizontal stripes), which is placed about 100 feet **SE.** from the rock.

Little Chebeag Island Point makes out 200 yards in a southerly direction from the southern end of Little Chebeag Island. It is marked on its end by a buoy (spar, red, No. 10).

Channel Rocks, with 9 feet of water on them, are three detached rocky spots extending in a north and south direction for nearly ¼ mile. They are marked by a buoy (spar, red, No. 12) placed close southward of the southernmost, and lying ⅜ mile **SW. ¾ S.** from the southern end of Little Chebeag Island.

Brimstone Point Ledge makes out nearly ¼ mile in a **NNW.** direction from the northern end of Great Diamond Island. It is marked by a buoy (spar, red, No. 4) placed on its northern end; there is no safe passage between it and the island.

Diamond Island Ledge is the shoal extending from the western shore of Diamond Island. Its extreme western end, which extends about 700 yards westward from the middle of the island, is marked by a buoy (spar, red, No. 2) lying 1 mile **NE.** by **N.** from Fort Gorges. There is no safe passage between it and the island. The ledge on which Fort Gorges is built is also called **Diamond Island Ledge.** It shows partly bare at low water and extends 400 yards in a westerly direction from the fort, and 600 yards in a northerly and easterly direction.

An **extensive shoal** extends for 1⅛ miles **S.** from **Mackeys Island,** the large island lying 1⅝ miles **N.** from Fort Gorges, and contracts the channel between the 12-foot curves ¼ mile **N.** of Fort Gorges to 200 yards.

NEW MEADOWS RIVER*

makes into the northeastern part of Casco Bay, and is of little commercial importance except for ice, which is shipped during the season; its entrance is much obstructed by ledges and rocks, few of which are marked. Strangers bound into the river should take a pilot, if coming from eastward, at Small Point Harbor; if from westward, signal should be made when off Halfway Rock, and while standing northeastward toward the entrance. Strangers seldom go above Long Island off the entrance to Winnegance Bay. The channel of the river is comparatively free from dangers and carries a depth of 6½ fathoms at low water to Fosters Point. At all of the ice wharves in the river, except at Birch Point, vessels lie aground at low water when loaded.

Cundy Harbor, in the west shore, about 1¼ miles above the mouth of the river, is a good anchorage with 3½ to 5 fathoms of water, sheltered from all winds; the village of **Cundy Harbor** is on its western shore.

The Basin, a cove in the east shore, about 1¼ miles above Cundy Harbor, has a narrow entrance and is only used by small local craft.

Winnegance Bay, on the east shore about 1 mile above the basin and 7 miles above Bald Head, is a large bight with good anchorage in 3½ to 4½ fathoms of water, but is little used.

For **tides** see table, page 27.

SAILING DIRECTIONS, NEW MEADOWS RIVER TO FOSTERS POINT.

These directions are good for a draft of 20 feet; vessels of the deepest draft can enter, but are advised to take a pilot. Strangers should not attempt to enter except in the daytime with clear weather.

1. ***Approaching to an anchorage in Cundy Harbor, from Eastward.***—Pass about ½ mile southward of Bantam Rock red whistling buoy, and steer **W. ½ N.** When Seguin Lighthouse bears *N.*, distant 1¾ miles, steer **WNW.**, passing about ½ mile south of Fullers Rock. When Bald Head Ledge spindle bears *NE.* by *N.*, distant a little over ½ mile, steer **N. ½ W.** for the eastern edge of Flag Island, leaving Bald Head ½ mile on the starboard hand, and when the southern end of Wood Island bears *E.*, distant a little over ¼ mile, steer **N.** by **E. ½ E.** Leave Jamison Ledge spindle about 250 yards on the port hand, and when the north end of *North Blacksnake*—bare, rocky islet at the entrance to Horse Island Harbor—bears *E.* steer **N.** by **W.** for the entrance to New Meadows River. When about midway between East Cundy Point and Bear Island steer **N.** by **E. ½ E.** for the entrance to Cundy Harbor, and anchor in the middle of the harbor in 4 to 5 fathoms water, soft bottom.

Or, if wishing to go farther up the river, proceed as directed in section 2, following.

Remarks and dangers.—Passing southward of Seguin Island, Mile Ledge buoy (can, red and black horizontal stripes) will be left about ¾ mile on the starboard hand. Fullers or Glovers Rock, a bare, rocky islet about ¼ mile **S.** of Small Point, will be on the starboard bow and about ¼ mile distant when in range with Small Point. Bald Head Ledge spindle (iron, red, with wheel on top) will be seen nearly 1 mile **WNW.** from Fullers Rock.

Mile Ledge is described on page 165.

Button Mould Ledges and **Bill Wallaces Ground** can be avoided by keeping Fullers Rock bearing northward of **E. ½ N.**, until more than ¼ mile beyond it. They are described on page 166.

Bald Head Ledge, a dangerous small ledge, bare at half tide and marked by a spindle, lies ⅜ mile **S. ½ W.** from Bald Head.

* See footnote on page 162.

On the **N. ½ W.** course, **Bald Head,** bare, precipitous headland, the western point of Cape Small and Gooseberry Ledge buoy (spar, red, No. 2) will be left about ¼ mile on the starboard hand in the order named. **E. Brown Cow,** low, bare island, and **Mark Island,** small and low, thickly wooded with stunted fir, will be on the port bow and left about ⅞ mile on the port hand; Wymans Ledge buoy (spar, black, No. 1) will be left nearly ½ mile on the port hand. **Wood Island** is high and partly wooded on top, with bare white rocks appearing in places; it is about 1¾ miles **N. ¾ W.** from Bald Head and will be on the starboard bow. It should be given a berth of ¼ mile to avoid the shoals making out from its western side. **Flag Island,** low, flat and well wooded, lying 1⅝ miles **NNW. ¾ W.** from Wood Island, will be ahead.

Gooseberry Island Ledge is about 250 yards long in a **NNE.** and **SSW.** direction, and partly awash at low water. It bears **N. ¼ W.,** distant a little over ¾ mile from Bald Head, and is marked off its southwestern end by a buoy (spar, red, No. 2), which is also a guide for entering Small Point Harbor. Vessels should not attempt to pass eastward of the buoy.

Wymans Ledge, about 200 yards in diameter, with 4 feet of water on it, lies ⅝ mile **ESE. ½ E.** from the southern end of Mark Island, and nearly ¾ mile **NNE. ¾ E.** from E. Brown Cow; it is marked on its eastern side by a buoy (spar, black, No. 1).

An unmarked **16-foot rock** lies 600 yards **S. by W. ½ W.** from the southern end of Wood Island. This island also has ledges making 200 yards in a southerly and westerly direction from its southern end.

Chivers Ledge, unmarked, with 6½ feet of water on it, lies ⅛ mile **NE.** by **E.** from the northern end of Mark Island. This island also has a ledge making out 300 yards in a northerly direction from its northern side. Vessels should not pass between Chivers Ledge and Mark Island.

On the **N.** by **E. ½ E.** course, a black spar buoy nearly ¼ mile northward of Wood Island will be left 350 yards on the starboard hand; the buoys marking Watering Place Cove (*Carrying Place Cove*) will be opened on the starboard bow when past Wood Island, and black buoy No. 1 at the entrance to the cove will be left about ¼ mile on the starboard hand when abreast of it. Jamison Ledge spindle (iron, black, cage on top) will be made on the port bow and left about 350 yards on the port hand. **North Blacksnake,** bare, rocky islet off the entrance to Horse Island Harbor, and ⅞ mile **E.** from Flag Island, will be on the starboard bow and left about 350 yards on the starboard hand.

A **small ledge** with 6 feet over it, and marked by a black spar buoy, lies nearly ¼ mile **NNW. ¼ W.** from the northern end of Wood Island. Northeastward of this ledge shoals make out from the southern end of Carrying Place Head in a westerly direction about 400 yards. Vessels should pass at least ¼ mile westward of the southern end of Carrying Place Head to avoid these ledges.

Jamison Ledge, bare at low water near its southern end, extends ⅝ mile in a **N.** by **E.** and **S.** by **W.** direction. It is marked on its southern end by a spindle (iron, black, cage on top) lying ½ mile **ESE.** from the south end of Flag Island.

Flag Island Ledge, bare at low water, lies about midway between Jamison Ledge and Flag Island. Strangers should pass eastward of Jamison Ledge.

South Point Burnt Coat Island Ledge makes out 300 yards in a **SW.** direction from the southern end of Burnt Coat Island. It is marked on its end by a buoy (spar, black, No. 1).

On the **N.** by **W.** course Goudy Ledge spindle (iron, red and black horizontal stripes) will be broad off the port bow and is left nearly ½ mile on the port hand. **Bear Island,** large, high and well wooded, at the eastern side of the entrance to New Meadows River, will be on the starboard bow.

Detached unmarked **ledges** extended ⅝ mile in a general **NE.** by **N.** direction from the northern end of Flag Island. The northernmost, with 15 feet of water on it, lies 600 yards **SE.** by **E. ¾ E.** from the red and black horizontally striped spindle marking Goudy Ledge.

Horse Island, the large island **N.** by **E.** from North Blacksnake, has ledges making out 400 yards from its southern and western side; the southern end of these ledges is marked by a black spar buoy.

There are also rocky spots with 14 feet on them lying in the entrance of the bight northward of Horse Island, between it and Bear Island.

Goudy Ledge, bare at half ebb, is marked by a spindle (iron, red and black horizontal stripes) placed on the southwest end of the ledge and lying nearly ⅝ mile **N.** by **E.** from the northern end of Flag Island.

The **N.** by **E. ½ E.** course for Cundy Harbor leads about midway between Bear Island and Fort Point on the western side of the entrance. The western shore above Fort Point to Cundy Harbor is comparatively bold-to, but should not be approached nearer than 200 yards. In Cundy Harbor favor the western shore, giving it a berth of 150 yards.

Bear Island has a ledge making out 300 yards in a **SSW.** direction from its southern end. Ledges also make out about 200 yards from its western side.

1 A. ***Approaching and to an Anchorage in Cundy Harbor, from Westward.***—When Halfway Rock Lighthouse is made stand for it; pass it about ½ mile on either hand and bring it to bear *WSW. ⅜ W.* and steer **ENE. ⅜ E.** for Mark Island. When the western end of White Bull comes in range with the western side of Ragged Island, bearing *NW. ¼ N.*, steer **NE.** by **N.** for Goudy Ledge spindle. Pass midway between Long Ledge

and Flag Island, and when 400 yards distant from the spindle steer so as to give it a berth of 150 yards on either hand, and when 400 yards beyond it bring it to bear *SSW.* ¼ *W.* and steer **NNE.** ¼ **E.** When the entrance to Cundy Harbor is opened haul a little more northward and follow the western shore, giving it a berth of about 200 yards. Anchor in the middle of the harbor in 4 to 5 fathoms.

Or, if wishing to go up the river, proceed as directed in section 2, following.

Remarks.—On the **ENE.** ¾ **E.** course **Mark Island** will show ahead as a low, rocky island, well wooded with stunted fir, and **E. Brown Cow,** bare, rocky islet, on the starboard bow, southward of it. **White Bull,** a bare, white-looking, rocky islet, will be on the port bow open westward of Mark Island. **Ragged Island** will show on the port bow, northwestward of White Bull, as a rocky island with a steep bluff on the southeastern end, its summit covered with stunted fir.

The **NNE.** ¾ **E.** course for Goudy Ledge spindle leads about midway between White Bull and Mark Island. **Flag Island,** small and wooded, will be a little on the starboard bow and **Long Ledge,** two bare islets, in range so as to appear as one, will be on the port bow; the course leads midway between Flag Island and Long Ledge.

The **NNE.** ¼ **E.** course leads about midway between the western shore, at the entrance to the river, and Bear Island.

Dangers.—**Halfway Rock** should not be approached closer than ⅜ mile so as to avoid the ledges making northward and southwestward from it. **Webster Rock,** with 11 feet of water on it, is the name of the ledge that makes northward from Halfway Rock. It is marked on its end by a buoy (spar, black, No. 1).

Lumbo Ledge is described on page 165.

Bold Dick is a small, bare rock, with good water as close as 200 yards from it, lying ¾ mile **SW.** ¼ **S.** from the southeastern end of Ragged Island. It can be avoided by keeping the southern end of Mark Island bearing northward of **E.** ¼ **N.**

Mark Island Ledge, small, detached ledge, just covered at high water, lies nearly ⅜ mile **W.** ¼ **S.** from the southern end of Mark Island. An unmarked 17-foot rock lies 200 yards **SSE.** from this ledge.

Chivers Ledge is described under section 1, preceding.

Sisters Ground, a group of shoals and detached ledges having from 5 to 18 feet on them, extend a little over ½ mile in a southeasterly direction from **The Sisters,** two bare, rocky islets, lying **NE.** by **E.** ¼ **E.** from the north end of Ragged Island; they can be avoided by keeping the eastern edge of White Bull bearing westward of **SW.** ¼ **S.**

A detached, unmarked **ledge,** with 7 feet of water over it, lies in a northwesterly direction about 250 yards from the northern end of Flag Island.

For **Goudy Ledge** and **Bear Island** see "Dangers" under section 1, foregoing.

North Jenny Ledge is about 400 yards long **N.** and **S.,** with 1 foot of water near its southern end; it lies ½ mile **WNW.** ½ **W.** from Goudy Ledge spindle.

A shoal extends 200 yards southward from **Rogue Island,** the small, bare island off the western point at entrance to the river.

East Cundy Point has a ledge making out 300 yards in a southeasterly direction from it and obstructing the bight northward of Rogue Island.

2. ***From Cundy Harbor Entrance to Fosters Point.***—When off the entrance to Cundy Harbor steer **NE.**; pass about midway between Sheep Island Ledge buoy (spar, black, No. 1) and the eastern shore. When the buoy bears abeam head about **NNE.** for *Birch Point,* the northern point at entrance to Winnegance Bay; then—

To enter Winnegance Bay.—When the southern end of Long Island bears abeam steer **NE.** by **E.** ½ **E.** and anchor in the northern side of the bay.

To proceed up the river.—When the southern point of Long Island bears abeam, distant about 350 yards, steer **N.** ½ **E.** for the eastern edge of Bragdons Island, passing about midway between Birch Point and Long Island, and above Birch Point, slightly favoring the eastern shore. When within ¼ mile of *Bragdons Island*—the easternmost and largest of a group known as the *Three Islands*—haul a little eastward and give Bragdons Island a berth of 150 to 200 yards. When the northern end of the island bears *W.* steer about **NW.** ½ **N.** and follow the shore of Fosters Point, giving it a berth of 200 to 300 yards. Anchor in the channel abreast Fosters Point in 3¾ to 5½ fathoms water. If desiring to proceed farther up the river take a pilot.

Remarks.—On the **NE.** course, Sheep Island Ledge buoy (spar, black, No. 1) will be on the port bow, and should be left about 200 yards on the port hand. The eastern shore from ¼ mile northward of Bear Island to **Basin Point**, the southern point at entrance to Winnegance Bay, is bold-to, and may be approached as close as 100 yards.

On the **NNE.** course, **Birch Point**, 60 feet high and well wooded except on its end, which is bare, will be ahead. **Winnegance Bay** will open southward and eastward of the point. The anchorage in Winnegance Bay is toward the northern shore eastward of **Jennys Nubble**, the small, rocky island off the northern point at entrance to the bay. The southern shore is foul and should be avoided. The southern end of **Long Island** will show on the port bow, ¼ mile **SW.** from Birch Point.

The eastern shore above Birch Point to opposite Bragdons Island is bold-to, and may be approached to 150 yards, except in the small bights. Bragdons Island is bold-to on its eastern side, and may be approached as close as 90 yards. Above Bragdons Island the course should favor the eastern shore, as shoals make out northwestward of the island and obstruct the passage between it and the western shore, and also fill the bight between Indian Point and Bombazine Island.

Fosters Point is on the eastern shore of the river and bears about **N.** by **W.** ½ **W.** from the northern end of Bragdons Island.

Dangers.—**Cedar Ledges**, marked at their southern end by a black spar buoy, are a group of bare rocks forming the northern point at entrance to Cundy Harbor; they extend about ⅝ mile in a **NNE.** ½ **E.** direction, and should not be approached closer than 100 yards from eastward.

A **ledge**, awash at low water and marked at its northern end by a red spar buoy, makes 400 yards in a **NNE.** direction from the northern end of Bear Island.

Sheep Island Ledge, with 2 feet of water over it, lies in the middle of the river nearly ¾ mile **N.** by **E.** ½ **E.** from the northern end of Bear Island. It is about 225 yards long in a **NE.** and **SW.** direction, and marked by a buoy (spar, black, No. 1) placed off its southeastern end.

Hen Island Ledge, bare at low water, lies a little over ¼ mile from the southern shore of Winnegance Bay and nearly ¼ mile **W.** ¾ **S.** from **Hen Island**—small, bare islet, the southernmost of the two lying off the southern shore of the bay. These islands have extensive shoals extending eastward from them and should be left well on the starboard hand when entering.

MERICONEAG SOUND, HARPSWELL SOUND.*

These waters are of no commercial importance, but they are the approach to one of the best anchorages in Casco Bay. The entrance lies 3¼ miles **NNE.** from Halfway Rock Lighthouse (see table, p. 20), and is marked on its western side by a stone monument on Little Mark Island. The sounds extend in a **NE.** direction 10 miles, and for the first 4 miles the prominent dangers are marked; above this strangers should not go without a pilot, as the channel is narrow, and flats make out some distance from the shores in several places. Vessels of the deepest draft can enter and find anchorage in 3¼ to 10 fathoms of water, with good holding ground. If in the vicinity of Halfway Rock, and unable to beat into Portland against a northwesterly wind, this is the best harbor that can be made.

Mackerel Cove, in the southwestern shore of **Baileys Island**, the eastern point at the entrance to Mericoneag Sound, is an excellent, though small, anchorage with 5 to 11 fathoms of water; it is open southwestward, but heavy seas never enter, and vessels can ride out any kind of weather. The post village of **Bailey Island** is on the cove. There are no dangers; the water shoals gradually toward its head. The entrance lies 1½ miles **ENE.** from the monument on Little Mark Island.

Opposite Mackerel Cove, on the western side of the sound, is the eastern entrance to **Potts Harbor**, leading between Potts Point and Haskell Island. The channel of this entrance is marked by buoys, but strangers should not attempt to enter it without a pilot, on account of the narrow, crooked channel and strong tidal currents.

Harpswell Harbor makes into the western shore about 3½ miles above the monument on Little Mark Island. This is an excellent, well-sheltered anchorage, with 3¼ to 6 fathoms of water, shoaling gradually southwestward toward the head of the cove. Vessels occasionally come here for cargoes of ice.

On the eastern shore of the sound opposite Harpswell Harbor, at the southern end of Orrs Island, is **Orrs Island**, a small village which has steamboat communication with Portland. **Wills Straits**, just south of the village, is a narrow and dangerous passage separating Orrs and Baileys islands.

For **tides**, see table, page 27.

* See footnote on page 162.

SAILING DIRECTIONS, HARPSWELL HARBOR.

Following the directions in section 1, spots with depths of 3¼ to 5½ fathoms will be found when about 1¼ miles eastward of Little Mark Island monument. In heavy weather the sea breaks on some of them.

The directions in section 1 A carry a least depth of 9 fathoms until up to the anchorage in Harpswell Harbor.

1. ***Approaching and Entering, from Eastward.***—Proceed as directed in section 1, "Sailing Directions, Crossing Casco Bay inside the islands," page 166. When on the **NW.** by **W.** ¾ **W.** course and about ½ mile distant from the monument, steer **NE.** ¾ **N.** through Mericoneag Sound. Leave Turnip Island Ledge buoy (spar, red, No. 2) about 350 yards on the starboard hand and Interval Shoal buoy (spar, black, No. 3) well on the port hand. Pass midway between Cox Ledge buoy (spar, red, No. 4) and Stovers Point buoy (spar, black, No. 5). When past the latter buoy haul northward and westward and anchor in Harpswell Harbor, in from 3¼ to 4½ fathoms, soft bottom.

To anchor in Mackerel Cove.—When, standing up Mericoneag Sound on the **NE.** ¾ **N.** course, Little Mark Island monument bears *WSW.* ¼ *W.*, bring it to bear astern and steer **ENE.** ¼ **E.** for the entrance to the cove. Give the western point at the entrance a berth of at least 150 yards, pass midway between the shores, and anchor about the middle of the cove in from 5 to 6¾ fathoms.

In heavy weather.—Pass south of Flat Ground and Lumbo Ledge and steer about **W.** ¾ **N.** for Halfway Rock Lighthouse. When the lighthouse is 2 miles distant, steer about **NW.** ½ **W.** so as to pass about 1 mile northward of it, and when Little Mark Island monument bears **NNE.** steer for it on that bearing. When Drunker Ledge spindle is a little abaft the starboard beam, distant about ¼ mile, steer **NE.** ⅜ **N.** taking care to pass ¼ mile westward of Mark Island Ledge buoy. Leave Little Mark Island monument on the port beam, distant about ¼ mile, and when Interval Shoal buoy is abeam, distant 300 yards, steer **NE.** ¾ **N.**, and proceed as directed in the first paragraph in this section.

Remarks.—The "Remarks" and "Dangers" approaching Little Mark Island monument are given under "Sailing Directions, Crossing Casco Bay inside the islands," page 166. The western shore of Baileys Island is comparatively bold-to, but should not be approached nearer than 200 yards. Standing up Mericoneag Sound black buoy No. 3 will be made a little on the port bow. The buoys marking the eastern entrance to Potts Harbor will be opened northward of Haskell Island and are left ⅜ mile on the port hand.

Anchoring in Harpswell Harbor, Stovers Point black buoy should be kept bearing southward of **SE.** ½ **S.** until about ¼ mile beyond it. There are no dangers in Mackerel Cove, the shores are bold-to, and may be approached as close to as 60 yards, except at its head and about halfway along the eastern shore.

Dangers.—**Interval Shoal,** with 16 feet of water on it, and lying nearly 2¼ miles **NE.** from Little Mark Island monument, is marked by a buoy (spar, black, No. 3) placed southeastward of it. There is no safe passage westward of this buoy.

Cox Ledge, bare at low water, extends 450 yards **NE.** by **N.** from the northern end of Baileys Island. Its northern end is marked by a spindle (iron, red, with cask) and a buoy (spar, red, No. 4).

Stovers Point Shoal, with 1 foot of water on it, makes out 300 yards northward from Stovers Point. It is marked on its northeastern end by a buoy (spar, black, No. 5).

Unmarked shoals make northward and northwestward from Stovers Point; they can be avoided by keeping black buoy No. 5 bearing southward of **SE.** ½ **S.**

A small, detached spot, with 13 feet over it, lies about 350 yards from the eastern shore and ⅜ mile northward of the steamboat wharf at Orrs Island.

See, also, "Dangers" in section 1 A, following.

1 A. ***Approaching and Entering, from Southward or Westward.***—When Halfway Rock Lighthouse is made, stand for it, being careful to avoid the dangers on East Cod and West Cod ledges; bring the lighthouse to bear *E.*, distant ¾ mile, and then steer **NE.** ¾ **N.** Leave Drunker Ledge spindle (iron, red and black horizontal stripes) and Mark Island Ledge buoy (spar, black, No. 1) ¼ mile on the starboard hand; when abreast

of Little Mark Island monument, steer **NE. ⅜ N.** until Interval Shoal buoy (spar, black, No. 3) is 300 yards distant on the port beam. Then steer **NE. ¾ N.** and proceed as directed in section 1, preceding.

Remarks.—The dangers on East Cod Ledge are described under section 1, "Sailing Directions, Portland Harbor," and those on West Cod Ledge under section 1 A, same heading.

On the **NE. ¾ N.** course Webster Rock buoy (spar, black, No. 1) will be left about ¼ mile on the starboard hand. Western Drunker Ledge spindle will be made on the starboard bow, and Eastern Drunker Ledge buoy (spar, red, No. 2) will be seen southeastward of the spindle. Mark Island Ledge black spar buoy will be on the starboard bow and is left on the starboard hand, about ⅜ mile beyond Western Drunker Ledge spindle; Turnip Island Ledge red buoy will be on the starboard bow and about ⅜ mile distant from Mark Island Ledge buoy. Little Mark Island monument will be on the port bow and left about ⅜ mile on the port hand. The remarks and dangers, passing through Mericoneag Sound, are given under section 1, foregoing.

Dangers.—An unmarked sunken **ledge** extends ¼ mile **WSW.** from Halfway Rock Lighthouse.

Webster Rock, with 11 feet of water on it, lies ¼ mile **N.** by **W.** from Halfway Rock Lighthouse. It is marked by a buoy (spar, black, No. 1) placed on the northwestern side of the rock.

Drunker Ledge consists of two distinct ledges lying in a **SE. ¼ E.** and **NW. ¼ W.** direction from each other and separated by a deep-water channel 400 yards wide. The eastern, with 4 feet of water on it, is marked by a buoy (spar, red, No. 2) placed on its southwestern side. The western, bare at half tide, is marked by a spindle (iron, red and black horizontal stripes) placed on its southwestern end and lying nearly 2 miles **NNE. ¼ E.** from Halfway Rock Lighthouse.

Mark Island Ledge, with 3 feet of water on it, lies nearly ¾ mile **SSE. ¾ E.** from Little Mark Island monument. It is marked on its western side by a buoy (spar, black, No. 1). See also page 170.

Whale Rock, a ledge awash at high water, lies a little over ⅜ mile **SW.** by **W. ¼ W.** from Little Mark Island monument.

For description of remaining dangers see "Dangers" under section 1, foregoing.

POTTS HARBOR.*

This **harbor** lies northward of the island, forming the western side of entrance to Mericoneag and Harpswell sounds, and is a large, irregular bight in the southern end of Harpswell Neck; it is a good anchorage with 3¼ to 5¼ fathoms of water, but of little commercial importance. A few vessels, laden with coal, and the daily steamer from Portland are about the only vessels, other than yachts and fishermen, that enter here. There are two entrances to the harbor; the eastern one, from Mericoneag Sound, leads between Potts Point and Haskell Island, and is narrow and crooked with very strong tidal currents; it is unfit for a sailing vessel, and only persons having a knowledge of the locality and acquainted with the set of the currents should enter by this passage. The western entrance, between Upper Flag Island and Horse Island, is straight and about 225 yards wide at its narrowest part. Both of these channels are marked by buoys. On the eastern shore of the harbor is the village of **South Harpswell.**

The **tides** are practically the same as at Portland (see table, page 27).

SAILING DIRECTIONS, POTTS HARBOR.

The following directions are for entering by the western entrance; the eastern entrance, on account of its narrow, crooked channel, and strong tidal currents, should not be attempted by a stranger.

1. ***Approaching from Eastward.***—Follow the directions in section 1, "Sailing Directions, Crossing Casco Bay inside the islands," page 166, until the north end of Eagle Island bears *SW.*, distant a little over ¼ mile. Then steer **N.** by **W. ¾ W.**, leave Upper Flag Island Shoal buoy (spar, red and black horizontal stripes) about 125 yards on the starboard hand, and when 350 yards northward of this buoy, steer **ENE. ⅝ E.** Leave the red bell buoy 250 yards on the port hand, and pass 200 yards southward of the southwestern end of Horse Island; Thrumbcap Ledge buoy (spar, black, No. 7) should be a little on the starboard bow. Pass 100 yards northward of this buoy, and anchor about 400 yards eastward of it in 5¼ fathoms water, soft bottom.

* See footnote on page 162.

Remarks.—**Upper Flag Island Shoal** extends 400 yards in a **NE.** by **E.** direction from the buoy. The channel between Horse Island and the ledges making northward from the eastern end of Upper Flag Island is about 225 yards wide, but when inside Horse Island the channel broadens and the harbor is clear, excepting Thrumbcap and the ledge making northeastward from it. The usual anchorage is northeastward and eastward from black spar buoy No. 7.

1 A. ***Approaching from Southward.***—Follow the directions in section 1 A, "Sailing Directions, Freeport River," page 176, and when the north end of Eagle Island bears *E.*, distant ⅜ mile, steer **NNE.** ¾ **E.**, heading for the bell buoy off the southwest point of Little Birch Island. Leave the red and black horizontally striped spar buoy off Upper Flag Island Shoal about 200 yards on the starboard hand, and when 350 yards northward of this buoy steer **ENE.** ⅝ **E.**, and follow the directions in section 1, preceding.

Remarks.—The western shore of Eagle Island should be given a berth of ¼ mile. **Little Birch Island** is low and bare, and **Horse Island** lies directly east of it. See, also, the remarks under section 1, preceding.

1 B. ***Approaching from Westward, through Luckses Sound.***—Follow the directions in section 1 B, "Sailing Directions, Freeport River," page 177, until the northern end of Stave Island is abeam, and then steer about **ENE.** ¼ **E.** so as to pass 150 yards northward of Stave Island Ledge buoy (spar, black, No. 5). From this buoy steer **E.** ¾ **S.** so as to pass 250 yards south of the red bell buoy off Little Birch Island, and when this buoy bears *N.*, distant 250 yards, steer **ENE.** ⅝ **E.** and follow the directions in section 1, preceding.

See the remarks under sections 1 and 1 A, preceding.

MIDDLE BAY.*

This bay makes northeastward on the west side of Harpswell Neck, and lies eastward of the Goose Islands and Birch and Whites islands; although it has good water, it is only used by fishermen and small vessels owned in the vicinity.

SAILING DIRECTIONS, MIDDLE BAY.

1. ***Approaching and Entering, from Southward.***—*I. Through Broad Sound.*—Follow the directions in section 1 A, "Sailing Directions, Freeport River," page 176, and when ¼ mile westward of Eagle Island steer **N.** ½ **E.** until the tripod beacon on Stockmans Island bears *WNW.*, distant ¾ mile. Then steer **NE.** ¼ **E.** and proceed as directed in paragraph III.

II. Through Luckses Sound.—Follow the directions in section 1 B, "Sailing Directions, Freeport River," page 177, and on the **NE.** ½ **E.** course when the north end of Stave Island is on the starboard beam, steer **ENE.** ¼ **E.** Pass 200 yards north of Stave Island Ledge buoy (spar, black, No. 5), and when the beacon on Stockmans Island bears *WNW.*, distant ¾ mile, steer **NE.** ¼ **E.** and proceed as directed in paragraph III.

III. On the **NE.** ¼ **E.** course, red spar buoy No. 8 will be left 400 yards on the starboard hand, and the shore of Whaleboat Island will be left about 350 yards on the port hand. When the north end of Whaleboat Island is abeam and in range with the north end of Little Whaleboat Island, steer **NE.** ½ **N.**, heading for *Shelter Island* (small, wooded island in the middle of the bay). Leave this island 200 yards on the port hand on a **NE.** ½ **N.** course, and leave *Black Rock* (small, bare rock nearly ½ mile *ENE.* from Shelter Island) about 200 yards on the starboard hand.

When Black Rock bears *S.*, distant nearly 300 yards, steer **NE.** ¾ **E.**; continue this course for 2¼ miles, leaving two red spar buoys on the starboard hand, and anchor midway between Scrag Island and the southern shore in 15 to 19 feet water, soft bottom.

*See footnote on page 162.

Remarks and dangers.—See the remarks and dangers under section 1 A or 1 B, "Sailing Directions, Freeport River," until the beacon on Stockmans Island bears **WNW.**

The **NE. ¼ E.** and **NE. ½ N.** courses lead well clear of all dangers. Lying eastward and northeastward of Shelter Island at a distance of ¼ to ½ mile are **several ledges** which are avoided by keeping the island aboard, distant 200 to 350 yards, and keeping westward of Black Rock.

The **NE. ¾ E.** course leads up the middle of the bay and about 600 yards from the shore and islands on the port hand. A small **13-foot spot** lies 450 yards from the northern shore ½ mile above Black Rock, and there is a ledge almost bare and 300 yards from the northern shore a little farther up the bay. Off the south shore there are two ledges which are marked by red spar buoys.

The water is shoal at the head of the bay with a narrow channel marked by two buoys and a beacon as guides to Dunning Wharf.

1 A. ***Approaching and Entering, from Westward.***—Follow the directions in section 1 C, "Sailing Directions, Freeport River," page 177, until Chebeag Bar buoy bears *S.*, then steer **E. ½ N.** Pass 250 yards north of black spar buoy No. 3 off Chebeag Point and 200 yards south of red spar buoy No. 4 on Green Island Ledge, and continue the course heading for the red and black horizontally striped spar buoy on Goose Ledge; as this buoy is approached leave it 150 yards on the port hand, and continue the course until *Irony Island* (small, wooded, rocky islet, the easternmost of the three islands northward of Goose Ledge) bears abeam, then steer **NE. ¼ E.** for Shelter Island. Leave the island 200 yards on the port hand, and steer **NE. ½ N.** so as to leave Black Rock 200 yards on the starboard hand. Then follow the directions in section 1, preceding.

Remarks and dangers.—The **E. ½ N.** course leads a little over ¼ mile north of Chebeag Point, and about the same distance north of *Little Whaleboat Island*, the island lying **E. ½ N.** distant nearly 2 miles from Chebeag Point. Little Whaleboat Island has ledges extending 400 yards north from it, some showing bare near high water.

Goose Ledge is a small rock with 4 feet of water over it, lying nearly midway between Little Whaleboat Island and the islands northeastward; the red and black horizontally striped spar buoy on Goose Ledge should be given a good berth.

The southern side of Irony Island should be given a berth of over 300 yards.

The eastern and western sides of Shelter Island are bold-to, but a ledge, bare near its end, makes off 300 yards northward and another about 150 yards southward from the island.

FREEPORT RIVER,*

also known as **Harraseeket River**, is west of Maquoit Bay; the approach lies **NNE. ½ E.** from **Chebeag Point**, the northeastern point of Great Chebeag Island, between Bibbers Island on the east and Great Moshier Island on the west. The entrance of the river is between Moores Point on the east and Stockbridges Point on the west, and is very narrow, with a least depth of 20 feet. From the entrance the channel leads between flats, mostly dry at low water, in a northerly direction 1¾ miles; a dredged channel 70 feet wide and about 7 feet deep then leads to the town of **Freeport**. The principal dangers at the approach and entrance to the river are marked by buoys. Freeport has very little commerce; a small steamer daily from Portland and small coasting vessels are engaged in the carrying trade.

SAILING DIRECTIONS TO ENTRANCE OF FREEPORT RIVER.

Following the directions in sections 1, 1 A, and 1 B, the least water will be about 3½ fathoms when eastward of Crab Island, near the entrance to the river.

1. ***Approaching and Entering, from Eastward.***—Proceed as directed in section 1, "Sailing Directions, Crossing Casco Bay inside the islands;" when on the **NW. ½ N.** course and midway between Eagle Island and Upper Flag Island, the northern end of Eagle Island bearing *SW.*, steer **N.** by **W. ¾ W.** Leave the buoys at the entrance to Potts Harbor on the starboard hand; Whaleboat Ledge buoy (spar, red, No. 2) will be on the starboard bow.

* See footnote on page 162.

When Whaleboat Ledge buoy bears *E.*, distant about 400 yards, steer **N.** by **E.** ½ **E.** with the western edge of French Island a very little on the starboard bow. When about ½ mile from French Island and the northern Upper Green Island bears *W.*, steer **N.** ⅜ **W.** Pass about 200 yards eastward of Moshier Ledge buoy (spar, red and black horizontal stripes), and when *Crab Island*—small, low, and bare islet—bears *W.*, distant about ¼ mile, steer **NW.** ¾ **N.** for red spar buoy No. 2, and anchor when nearly up to it in from 4 to 6 fathoms of water. Or, if wishing to go to Freeport, take a pilot.

Remarks.—The remarks and dangers until abreast Eagle Island are given under section 1, "Sailing Directions, Crossing Casco Bay inside the islands," page 166.

On the **N.** by **W.** ¾ **W.** course Upper Flag Island buoy (spar, red and black horizontal stripes) should be left over 100 yards on the starboard hand.

On the **N.** by **E.** ½ **E.** course, after leaving Whaleboat Ledge buoy, **French Island,** small, bluff, covered with spruce and fir and about 40 feet high, will be nearly ahead, and the **Upper Green Islands,** two small, bare, rocky islets, will be on the port bow.

On the **N.** ⅜ **W.** course Moshier Ledge buoy (spar, red and black horizontal stripes) will be a little on the port bow, and Crab Island Ledge buoy (spar, black, No. 1) beyond, and open a little westward of it.

On the **NW.** ¾ **N.** course Bowman Island Ledge buoy (spar, red, No. 2) will be ahead, and beyond, and nearly in range with it, Freeport Upper Ledge buoy (spar, black, No. 3) will be seen. Strangers should be careful not to be set too much westward in the channel, as extensive flats rise very abruptly from deep water westward of a line joining Moshier Ledge buoy and Bowman Island Ledge buoy, and about 150 yards eastward of Crab Island. There is good anchorage in the channel anywhere northward of Moshier Ledge buoy.

Dangers.—**Upper Flag Island Shoal** and **Little Birch Island** are described on page 174.

Whaleboat Ledge, a small, detached rock with 9 feet of water on it, lies nearly ¾ mile **NNW.** ½ **W.** from the southwestern end of Whaleboat Island. It is marked on its southwestern side by a buoy (spar, red, No. 2).

Little Whaleboat Ledge, with 2 feet on it, lying ⅝ mile **NE.** from Whaleboat Ledge, and the ledges making ¼ mile southward and westward from Little Whaleboat Island may be avoided by keeping Whaleboat Ledge buoy bearing southward of **SSW.**

Goose Nest Ledge lies nearly ⅝ mile **NW.** ½ **N.** from the northeastern end of Stockmans Island, the island marked on its southern end by a large tripod beacon; it is bare at half tide and extends ⅜ mile **N.** by **E.** from **Goose Nest,** a small, bare island, surrounded by ledges, which is marked near its southern end by a buoy (spar, red, No. 8).

Upper Green Islands have a ledge making out 400 yards northward from them. Southwestward of the islands is **Green Island Ledge** and buoy (spar, red, No. 4).

Moshier Ledge, with 10 feet on it, is marked by a buoy (spar, red and black horizontal stripes) placed southward of it and lying a little over ¼ mile **NE.** ¾ **E.** from the northeastern end of Great Moshier Island.

Bustings Island Ledge is a small, unmarked, 14-foot spot lying 400 yards **E.** from Moshier Ledge buoy.

Crab Island Ledge, dry at half tide, makes out **NE.** nearly ⅝ mile from Great Moshier Island. It is marked by a buoy (spar, black, No. 1) placed on its northeastern end.

A small, unmarked, 17-foot spot lies nearly ¼ mile **E.** from Crab Island.

1 A. ***Approaching and Entering, from Southward.***—When Halfway Rock Lighthouse is made stand for it; pass about ½ mile westward of it, and when it bears *E.*, steer **N.** ½ **E.** Pass about ½ mile eastward of W. Brown Cow and ¼ mile eastward of Broken Cave dry ledges, taking care to give the shore of Eagle Island a berth of over 400 yards. When the northern end of Eagle Island bears *E.*, distant ⅜ mile, steer **N.** ¼ **W.** until Whaleboat Ledge buoy (spar, red, No. 2) bears *E.*, distant about 400 yards, then steer **N.** by **E.** ½ **E.** and follow the directions in section 1, foregoing.

Or, from a position ½ mile *E.* of Halfway Rock Lighthouse, steer **N.** by **W.** ⅛ **W.**; give the shore of Eagle Island a berth of ¼ mile, and haul northward a little so as to bring the northern end of the island to bear *E.*, distant ⅜ mile. Then steer **N.** ¼ **W.** until Whaleboat Ledge buoy (spar, red, No. 2) bears *E.*, distant 400 yards; then steer **N.** by **E.** ½ **E.** and follow the directions in section 1, foregoing.

Remarks.—Approaching Halfway Rock care should be taken to avoid the dangers on East Cod and West Cod ledges, which are described under sections 1 and 1 A, "Sailing Directions, Portland Harbor."

On the **N.** ½ **E.** and **N.** by **W.** ¼ **W.** courses, Eagle Island, densely wooded, will show on the starboard bow, and **W. Brown Cow,** bare, rocky islet, on the port bow. The remarks and dangers beyond Eagle Island are given under section 1, foregoing.

Dangers.—**A dangerous ledge** makes off nearly ¼ mile in a **WSW.** direction and about 200 yards eastward from Halfway Rock Lighthouse.

Webster Rock is described on page 173.

Eagle Island Ledge, bare at low water, lies 300 yards **SE.** ½ **S.** from the southern end of Eagle Island; ledges with 8 to 10 feet of water, extend 300 yards **SE.** and 500 yards **E.** from the rock that shows bare.

Broken Cave is a group of bare rocks and small islets connected by ledges extending ⅝ mile in a general **NE.** direction from W. Brown Cow. They lie from ⅝ mile to 1 mile **SW.** by **W.** from Eagle Island, and can be avoided by keeping the beacon on Stockmans Island in range with, or open eastward of, the eastern point of Ministerial Island.

Eagle Island has **ledges** extending 400 yards from its western shore.

1 B. ***Approaching and Entering, from Westward, through Luckses Sound.***—Follow the directions in section 1 B, "Sailing Directions, Portland Harbor," and when Cape Elizabeth West Lighthouse bears *NW.*, distant 1⅛ miles, and Taylor Reef buoy (can, black, "T. R." in white letters) is distant about ¼ mile on the port hand, steer **NNE.** Broad Cove Rock buoy (can, black, "B. C." in white letters) will be left about ½ mile on the port hand, and Witch Rock buoy (gas-lighted, red, "W. R." in white letters) will be left about ⅝ mile on the port hand. The red and black horizontally striped can buoy marking The Hussey will be on the starboard bow; bring it to bear *E.*, distant about ⅝ mile, and steer **NE.** ½ **E.** through Luckses Sound, heading for about the middle of Whaleboat Island. When the northern end of Stockmans Island bears *NW.* by *W.*, distant about ¼ mile, steer **N.** ¼ **W.** so as to pass about 400 yards westward of Whaleboat Ledge buoy, and proceed as directed in section 1, foregoing.

Remarks.—The remarks and dangers approaching Cape Elizabeth are given under section 1 B, "Sailing Directions, Portland Harbor." On the **NNE.** course Broad Cove Rock buoy (can, black, "B. C." in white letters), Trundy Reef buoy (can, black, "T. R." in white letters), Jordan Reef buoy (nun, red and black horizontal stripes), Witch Rock buoy (gas-lighted, red, "W. R." in white letters), Ram Island Ledge tripod (red, wooden, 50 feet high, upper part boarded), and Ram Island Shoal buoy (spar, black, No. 5) will all be made on the port bow and left on the port hand.

Luckses Sound is comparatively free from dangers, and the western shores of Crotch and Stave islands, and the eastern shores of Marsh, Hope, Rogues, Little Bangs, and Stockmans islands are bold-to and may be approached to 150 yards. Sand Island is surrounded by ledges and has an unmarked 16-foot spot lying 300 yards eastward from it. The remarks and dangers above Stockmans Island are given under section 1, foregoing.

Dangers.—**Taylor Reef, Broad Cove Rock,** and **Trundy Reef** are described under section 1 B, "Sailing Directions, Portland Harbor." **Mitchell Rock** and **Pine Tree Ledge,** under section 1 A, same heading, and **Jordan Reef** and **Witch Rock,** under section 1, same heading.

The Hussey, a small rock with 12½ feet of water on it, lies about the middle of the entrance to Luckses Sound, and is surrounded by deep water; it is marked by a buoy (can, red and black horizontal stripes) placed on its southwestern side. To avoid the rock give this buoy a berth of 300 yards.

Crotch Island Ledge, with 3 feet of water on it in places, makes out ⅝ mile in a **SW.** ¼ **W.** direction from the southern end of Crotch Island. Its outer end, with 10 feet of water, is known as **Johns Rock** and is marked by a buoy (spar, red, No. 4). There is no safe passage between the buoy and the island.

An unmarked 16-foot spot lies 300 yards east of Sand Island.

Stave Island Ledge, bare at low water, extends ¼ mile **NE.** from the long, rocky point on the northeastern end of Stave Island. It is marked on its end by a buoy (spar, black, No. 5).

1 C. ***Approaching and Entering, from Portland Harbor.***—These directions are good for a draft of 12 feet. Strangers drawing more water should take a pilot.

Bring the Breakwater Lighthouse to bear *SW.* ⅛ *W.* and steer **NE.** ⅛ **E.**, passing close westward of red spar buoy No. 2, about 300 yards westward of buoy No. 4, and 400 yards westward of Cow Island Ledge black spindle. When the spindle bears abeam, steer **NE.** by **E.** ½ **E.** and pass about 300 yards southeast of Lower Basket Ledge black spindle, and when it bears abeam steer **NE.** ½ **E.**

Pass about 100 yards northward of Chebeag Bar buoy (spar, red, No. 4), and when it bears *S.* steer **E.** by **N.** about ¾ mile until the eastern end of Littlejohns Island comes in range with Cornfield Point, bearing about *N.* by *W.* ¼ *W.*; then steer **NE.** ½ **E.** Pass about 300

yards southeastward of the eastern end of Great Moshier Island and 200 yards southeastward of Moshier Ledge buoy (spar, red and black horizontal stripes), and when it bears *NW.* steer **N. ⅜ W.**; give it a berth of about 200 yards on the port hand. When *Crab Island*, small, low, and bare islet, bears *W.*, distant about ¼ mile, steer **NW. ¾ N.** and anchor southeastward of the red spar buoy, which will be seen ahead, in 4 to 6 fathoms water. If bound into the river take a pilot.

Remarks and dangers.—On the **NE. ½ E.** course Fort Gorges will be left nearly ¼ mile on the starboard hand. **Basket Island**, small, low, and thickly wooded, will be ahead.

Diamond Island Ledge is the shoal extending from the western shore of Diamond Island. Its extreme western end, which extends about 700 yards westward from the middle of the island, is marked by a buoy (spar, red, No. 2). The ledge on which Fort Gorges is built is also called **Diamond Island Ledge.** It is partly bare at low water and extends 400 yards in a westerly direction and 600 yards in a northerly direction from the fort; this, together with the extensive shoals extending 1½ miles **S.** from Mackeys Island, contracts the channel between the 12-foot curves ¼ mile **N.** of Fort Gorges to 200 yards.

Brimstone Point Ledge makes out nearly ¼ mile in a **NNW.** direction from the northern end of Great Diamond Island. It is marked on its end by a buoy (spar, red, No. 4).

Cow Island Ledge, partly bare at low water, is marked by a spindle (iron, black, cage on top), lying ⅛ mile **N.** by **W.** from the northeastern end of Cow Island. The ledge is about 250 yards long, **NNE.** and **SSW.**, and the spindle is near the southern end.

On the **NE.** by **E. ½ E.** course Lower Basket Ledge spindle should be on the port bow, and Seal Ledge buoy (spar, red, No. 2) will be on the starboard bow.

Clapboard Island Ledges, lying from 400 to 600 yards southward and eastward of the south end of Clapboard Island, show bare at half tide.

Lower Basket Ledge, bare at half tide, lies ½ mile **SE.** by **E.** from the southern end of Basket Island. It is marked on its southeastern end by a spindle (iron, black, cage on top). The ledge extends 275 yards westward and northwestward of the spindle, and about 150 yards eastward of it.

On the **NE. ½ E.** course Seal Ledge buoy should be left a little over ¼ mile on the starboard hand, and red spar buoy No. 4 will show a little on the starboard bow just open eastward of Littlejohns Island. The landing on Littlejohns Island will be a very little on the port bow. The course leads about midway between the red buoy on Chebeag Bar and Littlejohns Island. The channel here is about 200 yards wide.

Seal Ledge, bare at low water, makes out for ⅜ mile in a **NW.** direction from the western shore of Great Chebeag Island eastward of Lower Basket Ledge spindle. It is marked on its end by a buoy (spar, red, No. 2).

Chebeag Bar is a long, sandy bar, with scattered bowlders, bare at low water, making out from the middle of the northern shore of Great Chebeag Island and extending to within ½ mile of Littlejohns Island. It is marked on its northern end by a buoy (spar, red, No. 4). An unmarked **14-foot spot** lies ⅝ mile **SW. ¾ W.** from the buoy.

The **E.** by **N.** course leads for the red spar buoy on Green Island Ledge, and the black spar buoy marking Chebeag Point Ledge will be on the starboard bow; the southeastern end of Littlejohns Island should not be approached closer than ¼ mile on this course.

An extensive **shoal** extends from the shore of Great Chebeag Island between Chebeag Bar and **Chebeag Point**, the northeastern point of the island. The sailing line leads well northward of this shoal.

An unmarked **shoal** makes southward about 400 yards from the southeastern side of Littlejohns Island, nearly ½ mile eastward of Chebeag Bar.

The **NE. ½ E.** course leads for the southwestern end of **Bibbers Island**, about 40 feet high, with a few scattered trees. Great Moshier Island will be on the port bow, and a little open eastward of it will be seen Moshier Ledge buoy (spar, red and black horizontal stripes).

Chebeag Point Ledge, with 3 feet of water on it, makes 400 yards **NNE.** from the northeastern point of Great Chebeag Island. It is marked on its end by a buoy (spar, black, No. 3).

Green Island Ledge, a small, detached ledge with 6 feet of water on it, lies ¼ mile **SW.** by **W.** from the southernmost of the Green Islands. It is marked on its western side by a buoy (spar, red, No. 4).

Moshier Ledge and the remaining dangers are described under section 1, foregoing.

YARMOUTH RIVER*

is a narrow, crooked, shallow stream westward of Freeport River; its approach is westward of **Cousins Island**, in the northwestern part of Casco Bay; the entrance is between Foggs Point on the east and Parkers Point on the west, and lies **NNE. ½ E.** from the northwestern point of Cousins Island. The river makes in a northwesterly direction about 1¾ miles to the town of **Yarmouth.** Strangers can not enter without a pilot. **Cousins River**, a

* See footnote on page 162.

narrow, shallow stream, empties into the mouth of Yarmouth River from northward. The channels in the approach and up these rivers lead through extensive flats that are dry at low water.

SAILING DIRECTIONS TO ENTRANCE OF YARMOUTH RIVER.

Strangers should not attempt these directions except in the daytime with clear weather. The least depth on the sailing lines is 19 feet in section 1, 22 feet in section 1 A, and about 12 feet in section 1 B.

1. ***Approaching from Eastward.***—Proceed as directed in section 1, "Sailing Directions, Crossing Casco Bay inside the islands," page 166. When on the **NW. ½ N.** course, and the northern end of Eagle Island bears *SW.*, steer **N.** by **W. ¾ W.** Leave the buoys at the entrance to Potts Harbor on the starboard hand, and pass about 400 yards westward of Whaleboat Ledge buoy (spar, red, No. 2). The course leads nearly ⅜ mile *E.* of the northern point of Great Chebeag Island, and midway between Chebeag Point Ledge buoy (spar, black, No. 3) and Green Island Ledge buoy (spar, red, No. 4). When the former buoy is abaft the beam steer **W. ½ S.**, passing northward of Chebeag Bar buoy (spar, red, No. 4), about midway between it and Littlejohns Island. When this buoy bears *S.*, steer **SW.** by **W. ½ W.** until the southern and southwestern points of Cousins Island are in range bearing *NW.* by *N.*, then steer about **NW.** by **W.** Leave *Spruce Point*, the southern point of Cousins Island, 350 yards on the starboard hand, and when *Birch Point*, the westernmost point of Cousins Island, bears *ENE.*, distant a little over ¼ mile, steer **NE. ¾ N.**, and anchor in 3½ to 4 fathoms, with Birch Point bearing about **SSW.** If bound into Yarmouth River take a pilot.

Remarks.—The red and black horizontally striped spar buoy, and red bell buoy, marking the western entrance to Potts Harbor, will be left 200 and 500 yards respectively on the starboard hand. Green Island Ledge buoy (spar, red, No. 4) should be on the starboard bow; the Upper Green Islands will show on the starboard bow, and black spar buoy No. 3, off Chebeag Point, will show on the port bow.

Standing for Chebeag Bar care must be taken not to be set southward on to the shoals making out from the northern side of Great Chebeag Island. Shoals also make out for 400 yards southeastward from the southeastern side of Littlejohns Island.

On the **SW.** by **W. ½ W.** course Basket Island and Upper Basket Ledge spindle will be on the starboard bow, and Lower Basket Ledge spindle on the port bow.

The **NW.** by **W.** course leads about 350 yards southward of Spruce Point. The approach to Yarmouth River, between Cousins Island and the mainland, is much obstructed by shoals about ¾ mile above Birch Point. Strangers should not stand over ½ mile beyond the point.

Dangers.—**Goose Nest Ledge, Whaleboat Ledge,** and **Little Whaleboat Ledge** are described under section 1, "Sailing Directions to Entrance of Freeport River," page 176, and **Green Island Ledge, Chebeag Point Ledge,** and **Chebeag Bar** are described under section 1 C, same heading.

Upper Basket Ledge, bare at low water, is marked on its northern side by a spindle (iron, black, cage on top) lying ⅜ mile **NE.** by **E. ¼ E.** from the northeastern end of Basket Island. The ledge is about 300 yards in diameter and surrounded by deep water.

Unmarked **shoals** fill the bight between Spruce and Birch points, and extend 200 yards southward from the latter point.

1 A. ***Approaching from Westward.***—Follow the directions in section 1 B, "Sailing Directions to Entrance of Freeport River," page 177, and when the red and black horizontally striped can buoy, marking the Hussey, bears *E.*, distant ⅜ mile, steer about **NNW. ¼ W.** through Husseys Sound. Give the southwestern end of Overset Island a berth of about 250 yards, and when *Pumpkin Knob*—a round islet with a few trees on it, off the northern end of Peaks Island—bears *W.*, distant about 400 yards, steer **N.** for the east end of Cow Island. Having stood on this course ⅜ mile, change course to **N.** by **E. ¾ E.** Having stood on this course about 3 miles, pass about 300 yards eastward of Upper Clapboard Island Ledge buoy (spar, red, No. 8), and when the north end of Basket Island bears

E. by *S.*, steer **NE.** $\frac{3}{4}$ **N.**; give Basket Island a berth of at least 250 yards, and Birch Point a berth of about 400 yards; anchor when about $\frac{1}{2}$ mile beyond the latter in $3\frac{1}{2}$ to 4 fathoms, soft bottom.

Remarks.—The remarks and dangers until up to the Hussey are given under section 1 B, "Sailing Directions to Entrance of Freeport Harbor," page 177. The shores of Husseys Sound are comparatively bold-to, and can be approached as close as 300 yards except off the southern side of the entrance, where Eastern Point Breaker makes out $\frac{1}{4}$ mile from the eastern shore of Peaks Island.

On the **N.** by **E.** $\frac{3}{4}$ **E.** course the southwestern shore of Long Island will be left about $\frac{1}{4}$ mile on the starboard hand, and the eastern shore of Cow Island $\frac{1}{4}$ mile on the port hand. The black iron spindle marking Cow Island Ledge will be left about $\frac{1}{4}$ mile on the port hand. **Basket Island,** low and thickly wooded, will show a little on the starboard bow, and eastward of it the black iron spindles on Lower Basket and Upper Basket Ledges. Red spar buoy No. 8 will show a little on the port bow. After changing course to **NE.** $\frac{3}{4}$ **N.,** care should be taken to keep at least 225 yards from Basket Island, to avoid the ledges making westward from it.

Dangers.—**Eastern Point Breaker,** with 11 feet on it, makes out $\frac{1}{4}$ mile from the eastern shore of Peaks Island, and is marked off its eastern end by a buoy (spar, black, No. 1). It can be avoided by keeping the eastern side of Pumpkin Nob bearing westward of **NNW.**

Soldier Ledge, an unmarked spot with $4\frac{1}{4}$ fathoms over it, lies in the middle of Husseys Sound, 550 yards **WNW.** $\frac{1}{4}$ **W.** from Overset Island.

Upper Clapboard Island Ledge, a detached ledge with 7 feet on it, lies $\frac{3}{8}$ mile **W.** from the southern end of Basket Island. It is about 150 yards long in a **E.** and **W.** direction, and is marked on its southern side by a buoy (spar, red, No. 8).

Unmarked **ledges** surround Basket Island, and extend 200 yards from its western and northwestern shores.

1 B. ***Approaching from Portland Harbor.***—Bring the Breakwater Lighthouse to bear *SW.* $\frac{1}{8}$ *W.* and steer **NE.** $\frac{1}{8}$ **E.** for Basket Island. Pass close westward of red spar buoy No. 2, about 300 yards westward of red spar buoy No. 4, and 400 yards westward of the black iron spindle on Cow Island Ledge. Pass about $\frac{3}{8}$ mile eastward of Clapboard Island, and when its northern end bears *NW.* steer **NE.** $\frac{3}{4}$ **N.,** and leave red buoy No. 8 about 200 yards on the port hand, and if necessary haul up so as to leave Basket Island 350 yards on the starboard hand. Then proceed as directed in section 1 A, foregoing.

Remarks.—The dangers on the **NE.** $\frac{1}{8}$ **E.** course, until past Cow Island Ledge, are given under section 1 C, "Sailing Directions to Entrance of Freeport River," page 178. **Clapboard Island,** about 40 feet high, with a thick growth of trees on it, and small, rocky islets off its southern end, will be on the port bow, and should be given a berth of over $\frac{1}{4}$ mile at its southern and southeastern ends, to avoid the ledges making out from them. Beyond Basket Island, the remarks and dangers are given under section 1 A, foregoing.

PORTLAND HARBOR.*

This harbor, in the western side of Casco Bay, is the approach to the city of **Portland,** the principal maritime port on the coast of Maine. The entrance from seaward is marked by Cape Elizabeth Light-vessel which lies about $36\frac{1}{2}$ miles **W.** $\frac{1}{4}$ **S.** from Monhegan and 57 miles **NE.** $\frac{1}{4}$ **N.** from Cape Ann; Portland Head Lighthouse, on the western point at the entrance, is $3\frac{1}{2}$ miles **N.** $\frac{1}{4}$ **E.** from Cape Elizabeth East Lighthouse, an offshore guide to the entrance. There are several entrances to the harbor between the islands eastward; some of these are marked by aids to navigation, but they are principally used by local vessels or those towing from Portland to different points in Casco Bay and its estuaries. Off Cape Elizabeth and the entrance are numerous ledges and sunken rocks which make the approach dangerous in thick weather, especially for deep-draft vessels, but in clear weather entrance for the largest vessels is comparatively easy as the principal dangers to be avoided are marked by buoys.

Portland has a large foreign and coastwise trade, and is entered by the largest vessels; steamers leave the port loaded to 30-feet draft. Inside its entrance the port is known as the Lower and Upper harbors. Two villages, **South Portland** and **Knightsville,** are on the Cape Elizabeth side of the Upper Harbor; the former has communication with Portland by ferry, and the latter by a drawbridge.

*Shown on charts **106, 107,** scale $\frac{1}{80,000}$, price of each, $0.50; **315,** scale $\frac{1}{40,000}$, price $0.25; **325,** scale $\frac{1}{20,000}$, price $0.40.

The Lower Harbor is southward and eastward of a line from Fort Gorges to Fort Preble, including Diamond Island Roads, the latter being an excellent anchorage between the islands east of Portland Breakwater, with depths ranging from 3½ to 7 fathoms.

The Upper Harbor is westward of a line from Fort Gorges to Fort Preble, and is formed by the **Fore River** which makes southwestward between Cape Elizabeth on the south and the city of Portland on the north. **A breakwater,** with a lighthouse at its end (see table, page 20), extends in a northeasterly direction from the northern part of Cape Elizabeth. Portland bridge crosses the Upper Harbor about 1¼ miles above the end of the breakwater, and above this bridge are three others; the width of the draws is about 75 feet.

Back Cove is on the north side of the city of Portland. It is nearly all bare at low water, and has a dredged channel along the northern water front of the city 300 feet wide and 11 feet deep. Near its entrance the cove is crossed by two drawbridges; width of draws about 60 feet.

The depth of water in the channel to the Upper Harbor and Quarantine anchorage is 6 fathoms, and in the Upper Harbor it is 30 feet. Alongside the wharves the depths range from 12 to 30 feet, according to locality. The channel is easily followed in clear weather when the buoys marking the principal dangers can be seen. It leads in a general **N.** by **W.** direction past Portland Head and westward of Cushing and House islands; when past the latter it leads about **NW.** for the eastern end of the peninsula on which the city is built; it then turns southwestward along the city front.

Prominent objects.—High Head, and Cape Elizabeth Lighthouses and life-saving station will be readily distinguished. The eastern shore of Cape Elizabeth, northward of the lighthouses, is moderately high and rocky with ledges, which show bare at low water, making out in many places. **Portland Head Lighthouse** is about 3¼ miles **N.** ¼ **E.** from Cape Elizabeth East Lighthouse. **Cushing Island,** high, with few trees and rocky water line, lies **NNE.** from Portland Head, on the eastern side of the entrance to the harbor; the large hotel near the western end of the island is a prominent mark. **Ram Island*,** a bare, rocky islet, surrounded by ledges, on the southernmost of which is a beacon, is about ⅜ mile **S.** from **White Head,** the high eastern end of Cushing Island. Spring Point Ledge Lighthouse, 1¼ miles, **N.** ⅛ **W.** from Portland Head, is on the western side of the channel, and is the principal guide when entering the harbor. Northward and northeastward of Cushing Island are numerous islands which lie in the western part of Casco Bay. When standing into the entrance the observatory on **Munjoys Hill,** the northeastern end of Portland, will show above the trees and houses.

Pilots.—Between October 1 and May 1 a pilot boat will usually be found cruising outside Portland Head, and vessels desiring a pilot will be boarded when making signal. In the summer pilots are on the lookout for vessels requiring their services, and vessels making signal for a pilot should stand off and on outside of Portland Head until boarded. There are licensed pilots for this port, but pilotage is not compulsory. Strangers entering the port generally take a pilot. The rates are $2.50 per foot draft entering, and $1.25 per foot draft leaving the port.

Towboats will usually be found cruising off the entrance and in the harbor. They are used by vessels going alongside the wharves or through the bridges. Regular rates have been adopted for towing vessels within the harbor, but for towing in from sea an agreement is made between the vessel and the towboat.

Anchorage.—The usual anchorage for large vessels is in Diamond Island Roads, or between Fort Gorges and Fish Point. Vessels sometimes anchor, for a limited period, in the channel below Fort Preble, but the holding ground is not good. The anchorage in the Upper Harbor is on the Cape Elizabeth side of the channel and is marked by buoys (see Harbor Regulations, Appendix II). The **Quarantine anchorage** is off House Island in a depth ranging from 3½ to 7 fathoms. Vessels subject to visitation by the health officer do not proceed above House Island until after they have been boarded and have been given pratique.

Harbor regulations.—The harbor master has charge of the anchorages and sees that vessels do not anchor outside the authorized limits (see Harbor Regulations, Appendix II).

Quarantine.—See National Quarantines in Appendix IV.

Marine Hospital.—The Marine Hospital is situated 1 mile from the city. The surgeon in charge has an office at the custom-house (see Appendix IV).

Supplies.—Anthracite and bituminous coal in any quantity can be had alongside the wharves or from lighters. Water can be obtained alongside the wharves or from water boats. Provisions and ship-chandler's stores are to be had in the city.

Repairs.—The facilities for repairing wooden vessels are of the best. There is one marine railway on the Cape Elizabeth side of the harbor. The greatest draft taken out is 10 feet forward and 16 feet aft, and the capacity is vessels up to 1,200 registered tons.

The facilities for repairs to machinery of steamers are good. There are several machine shops where building and repairing can be done.

* A lighthouse is to be erected on Ram Island.

Storm warning displays of the United States Weather Bureau are shown from a building opposite the post-office, and can be readily seen by the shipping in the harbor. For explanation of signals see Appendix III.

Ice seldom obstructs navigation; when it does it is only for a limited time. The towboats keep a clear channel to the wharves.

Tides.—For tides see table, page 27; also the tide tables for the Atlantic Coast of the United States, in which the tides are predicted for every day of the current year.

SAILING DIRECTIONS, PORTLAND HARBOR.

These directions are good for vessels of the deepest draft, and lead to the anchorage in Diamond Island Roads or to the Quarantine anchorage. Directions for entering Portland Harbor from northward, for vessels of 12 feet or less draft that have crossed Casco Bay inside the islands, are given in section 2, page 167.

1. ***Approaching from Eastward, passing south of Halfway Rock.***—Follow the directions for crossing Casco Bay outside the islands, page 165. I. Or, when Halfway Rock Lighthouse is made, steer so as to pass about ⅝ mile south of it and about ⅝ mile north of the whistling buoy lying south of the lighthouse. Then steer **W. ½ N.**, heading for Portland Head Lighthouse; leave Witch Rock gas-lighted buoy 400 yards on the port hand and the tripod beacon on Ram Island Ledge about 500 yards on the starboard hand. When the beacon bears *NE.*, distant about 750 yards, steer **NW.** by **W.**, leaving the red bell buoy off the southwestern point of Cushing Island about 300 yards on the starboard hand. When Spring Point Ledge Lighthouse bears between **N.** by **W. ¼ W.** and **N.** by **W.** steer for it and follow the directions in section 2.

At night steer for Portland Head Light, as directed above, until about ¼ mile from it, and as soon as Spring Point Ledge Light shows white haul sharply up for it and steer for the light, keeping in its white rays. As the light is approached, steer about **N.** by **E.** so as to leave it 300 yards on the port hand, and when Portland Breakwater Light bears *W.* anchor in Diamond Island Roads in 6 fathoms of water, soft bottom.

II. Or, bring Portland Head Lighthouse to bear **WNW. ¼ W.** and steer for it on the bearing. Pass about 400 yards south of Witch Rock gas-lighted buoy, and when the buoy bears abeam steer **NW. ¾ W.** and pass about 200 yards south of the bell buoy off the southwestern point of Cushing Island. When Spring Point Ledge Lighthouse bears about **N.** by **W.**, steer for it and follow the directions in section 2.

At night proceed as directed above until Spring Point Ledge Light shows white, then steer for it and follow the directions given above for entering at night.

Remarks.—On the **W. ½ N.** course from Halfway Rock, **Junk of Pork,** bare and nearly flat rock, with grass on its highest part, will be left about ¾ mile on the starboard hand. **Outer Green Island** is just northward of Junk of Pork. **White Head,** the eastern point of Cushing Island, shows as a high, abrupt, rocky bluff, with a round summer house on its highest part; the large hotel near the western end of the island shows conspicuously.

Southward of White Head is **Ram Island,** and farther south is the tripod beacon on Ram Island Ledge. **Peaks Island** is the large island north of White Head, and **Husseys Sound** leads into Casco Bay eastward of it. There are channels leading into Portland Harbor between Cushing and Peaks islands and between Peaks and Great Diamond islands, but they should not be attempted by a stranger without the chart. The gas-lighted buoy which will be seen southward of the sailing line should be given a berth of 400 yards by deep-draft vessels.

The **NW.** by **W.** course leads about 400 yards south of the southwestern point of Cushing Island, and fair into the middle of the entrance to the harbor. Spring Point Ledge Lighthouse (see table, page 20) is the leading mark into the entrance either by day or night.

Dangers.—**East Cod Ledge** has depths ranging from 4¾ to 7½ fathoms over it, and lies 3¼ miles **S.** by **W. ½ W.** from Halfway Rock Lighthouse; the sea breaks over it in heavy weather. To avoid this ledge and West Cod Ledge keep Portland Head Lighthouse bearing westward of **WNW. ¼ W.** until Halfway Rock Lighthouse bears eastward of **NE.**

Bulwark Shoal, a dangerous ledge with 14 feet over it, is the easternmost of the line of rocks forming West Cod Ledge; it lies about 3¼ miles **SW. ¼ S.** from Halfway Rock Lighthouse, and is marked by a buoy (nun, red and black horizontal stripes) placed about ⅛ mile **SE.** from the shoalest part of the ledge. West Cod Ledge is described under section 1 A.

Witch Rock is a small rock with 4 fathoms of water over it, and lies nearly ¾ mile **SE. ¼ S.** from the beacon on Ram Island Ledge and 1⅝ miles **ESE. ⅞ E.** from Portland Head Lighthouse. A buoy (gas-lighted, red, with "W. R." in white letters) is placed about 100 yards **SE.** from the shoalest part of the rock.

Ram Island Ledge is an extensive ledge showing partly bare, and lying just southward of Ram Island. The southern end of the ledge is marked by a red tripod beacon about 50 feet high, which bears **ENE. ⅞ E.**, distant 1 mile from Portland Head Lighthouse.

Jordan Reef is about 200 yards long **NE.** and **SW.**, and has a least depth of 22 feet over it. A buoy (nun, red and black horizontal stripes) is placed 50 yards southeast from the reef and bears **SE. ¾ E.**, distant 1 mile from Portland Head Lighthouse.

Catfish Rock has 16 feet of water over it and lies about 150 yards westward of the southwestern point of Cushing Island; it is marked by a buoy (spar, red, No. 2), which is left on the starboard hand when entering. About 250 yards south of the southwestern point of Cushing Island is a red bell buoy.

1 A. ***Approaching from Eastward or Southward, passing through West Cod Ledge.***—Shape a course so as to pass about 5 miles southeastward of Cape Elizabeth Lighthouses, and when Cape Elizabeth Light-vessel is made steer for it on any bearing between **SW.** by **W.** through *W.* and *N.* to **E. ¾ N.** Leave the light-vessel on either hand and with the light-vessel bearing *SSE.* ⅜ *E.* steer **NNW. ⅜ W.** for Portland Head Lighthouse. When the two Cape Elizabeth Lighthouses are in range steer **N.** until Portland Head Lighthouse bears **NW.** by **N.** Steer for Portland Head Lighthouse on the **NW.** by **N.** bearing, and when it is about ½ mile distant ahead and Spring Point Ledge Lighthouse bears between **N.** by **W. ¼ W.** and **N.** by **W.**, steer for the latter lighthouse, passing about ¼ mile eastward of Portland Head Lighthouse and about 300 yards westward of the southwestern point of Cushing Island; then follow the directions in section 2.

Or, being outside of West Cod Ledge, bring Portland Head Lighthouse to bear **NW.** and steer for it on this bearing until the two Cape Elizabeth lighthouses are in range; then steer **NW.** by **W. ½ W.** until Portland Head Lighthouse bears **NW.** by **N.** Steer for the lighthouse on this bearing, and follow the directions in the preceding paragraph.

Remarks.—Approaching from southward at night to pass between West Cod Ledge Rock and Corwin Rock, keep southward of a line joining Wood Island Light and Cape Elizabeth Light-vessel until up to the light-vessel, or until Portland Head Light bears **NNW. ⅜ W.**; this will clear the Hue and Cry Rocks.

The **NNW. ⅜ W.** course from the light-vessel for Portland Head Lighthouse leads midway between West Cod Ledge Rock and Corwin Rock. When the course is changed to **N.** it is to avoid Willard Rock.

The **NW.** by **N.** course for Portland Head Lighthouse leads midway between Pine Tree Ledge and Willard Rock; the lighthouse should be given a berth of nearly ¼ mile while passing it. See also the remarks under section 2.

Dangers.—**West Cod Ledge** is a broken line of rocks with deep water between them, extending 5 miles in an **ENE.** and **WSW.** direction, eastward of Cape Elizabeth; **Bulwark Shoal**, the easternmost of these rocks, is described under section 1, above. **Bache Rock** has 4¼ fathoms of water over it, and lies 5 miles **E. ¼ N.** from Cape Elizabeth East Lighthouse; the sea breaks over it in heavy gales. **West Cod Ledge Rock** has a depth of 4¼ fathoms over it and lies 3¼ miles **E. ⅝ S.** from Cape Elizabeth East Lighthouse; it is not marked, but the sea breaks over it in heavy gales. **Corwin Rock**, with 3¼ fathoms over it, lies 2⅝ miles **SE.** by **E. ¼ E.** from Cape Elizabeth East Lighthouse; it is marked by a buoy (nun, red and black horizontal stripes, "C. R." in white letters) placed about 30 yards **SE.** from the rock. Deep-draft vessels should leave this buoy on the port hand when standing for Portland Head Lighthouse. **Alden Rock** is the westernmost rock of West Cod Ledge: it has 6 feet over it and lies 2 miles **SE. ¾ E.** from Cape Elizabeth East Lighthouse. A buoy (can, black, "A. R." in white letters) is placed 300 yards **S.** by **E.** of the rock. Vessels of deep draft should not pass between this buoy and Corwin Rock, which is about ¼ mile **ENE.** from Alden Rock, as the depth is 4¼ to 5¼ fathoms, and the sea breaks in heavy gales.

East Hue and Cry Rocks is a cluster of rocks, with depths of 3¼ to 6¼ fathoms over them, lying 3 miles **SE.** by **S.** from Cape Elizabeth East Lighthouse; the shoalest part of this ledge is about ¼ mile long in a **NNW.** and **SSE.** direction, and is marked off its eastern side by a buoy (can, black, No. 1). About ¼ mile south of this buoy is a spot with 4¼ to 6¼ fathoms over it.

West Hue and Cry is a rock with 4¼ fathoms over it, lying ⅜ mile **W.** from East Hue and Cry Rocks buoy.

Old Anthony, or **Vapor Rock**, is described under section 1 B, following.

Mitchell Rock has 5¼ fathoms over it, and is dangerous only in heavy weather; it lies 1⅝ miles **E.** from Cape Elizabeth East Lighthouse.

Broad Cove Rock and **Trundy Reef** are described under section 1 B, following.

Willard Rock has 5¼ fathoms over it and lies nearly 1¾ miles **SSE.** ½ **E.** from Portland Head Lighthouse.

Pine Tree Ledge, with 3½ fathoms over it, small, and unmarked, lies 1⅝ miles **SE.** from Portland Head Lighthouse.

Jordan Reef and **Witch Rock** are described under section 1, preceding.

1 B. *Approaching from Southwestward.*—When Cape Elizabeth Lighthouses are made, bring the east lighthouse to bear between **N.** and **NNE.** and steer for it between these bearings, passing from ¼ to ¾ mile westward of the whistling buoy. Then bring the east lighthouse to bear *N.*, and when the southern end of Richmonds Island bears about *W.*, or Wood Island Lighthouse bears *SW.* by *W.* ⅝ *W.*, steer **NE.** by **E.** ⅝ **E.** until Cape Elizabeth East Lighthouse bears *NW.* Then steer **N.** by **E.** ¼ **E.**, heading for the eastern end of Peaks Island, and when Portland Head Lighthouse bears **NW.** by **N.**, steer for it on this bearing. When Portland Head Lighthouse is about ½ mile distant, and Spring Point Ledge Lighthouse bears between **N.** by **W.** and **N.** by **W.** ¼ **W.**, steer for the latter lighthouse and pass about ¼ mile eastward of Portland Head Lighthouse. When a little over ¼ mile past Portland Head Lighthouse keep Spring Point Ledge Lighthouse close on the bearing **N.** by **W.**, and follow the directions in section 2.

Note.—It is advisable for strangers entering at night to follow the directions in section 1 A, foregoing.

Remarks.—Approaching Cape Elizabeth Lighthouses from southwestward, Saco Bay and Wood Island Lighthouse will be left on the port hand. If well westward, the hotels and summer houses on Old Orchard Beach will be seen about 7½ miles westward of Cape Elizabeth lighthouses. **Prouts Neck**, the northern point of Saco Bay, is about 5 miles **W.** from Cape Elizabeth, and Richmonds Island is about 2 miles southwestward of the lighthouses. Following the directions, when about 3 miles distant from Cape Elizabeth Lighthouses a sharp lookout should be kept for the buoys marking the principal dangers.

When standing on the **NE.** by **E.** ⅝ **E.** course Cape Elizabeth should be left about 1 mile, and Taylor Reef buoy (can, black, "T. R." in white letters) about ⅝ mile, on the port hand. When the course is changed to **N.** by **E.** ¼ **E.** Taylor Reef buoy should be distant ¼ mile on the port quarter; the eastern edge of Peaks Island will be ahead, with Husseys Sound showing as a small opening just eastward of it. As Portland Head Lighthouse is approached on the **NW.** by **N.** course, Jordan Reef buoy will be left on the starboard hand. Standing for Spring Point Ledge Lighthouse, Portland Head should be given a berth of ¼ mile until about ¼ mile northward of it, when the vessel should steer **N.** by **W.** for Spring Point Ledge Lighthouse.

Dangers.—**Old Anthony**, or **Vapor Rock**, has 19 feet over it and lies 1¾ miles **S.** by **E.** ¼ **E.** from Cape Elizabeth East Lighthouse; it is marked off its southern side by a buoy (can, red and black horizontal stripes, "O. A." in white letters). About ¼ mile **SW.** by **W.** from this buoy is a red whistling buoy which bears **S.** ⅝ **E.**, distant 2 miles from Cape Elizabeth East Lighthouse.

Watts Ledge makes off about ⅝ mile eastward from the southeastern point of Richmonds Island; it is partly bare, and is avoided by keeping Cape Elizabeth East Lighthouse bearing northward of **NE.** ¼ **N.**

Lying 1¼ miles **SW.** by **S.** from Cape Elizabeth East Lighthouse is a spot with 4½ fathoms over it, on which the sea breaks in heavy gales.

Taylor Reef is a group of rocks with 15 to 18 feet over them, which extends about ¼ mile in an **ENE.** and **WSW.** direction, lying about ¼ mile southeastward of Cape Elizabeth Lighthouses. A buoy (can, black, "T. R." in white letters) is placed about 100 yards **SSE.** of the center of the reef. Vessels entering should leave this buoy well on the port hand.

Alden Rock, **Corwin Rock**, and **Mitchell Rock** are described under section 1 A.

A **spot** with 18 feet over it lies nearly ¼ mile **E.** ¼ **N.** from Cape Elizabeth East Lighthouse.

Broad Cove Rock is a dangerous rock with 7 feet of water over it, lying off Broad Cove and about 1 mile **NE.** by **N.** from Cape Elizabeth East Lighthouse. A spot with 18 feet over it lies a little over ¼ mile **NE.** from the rock. A buoy (can, black, "B. C. R." in white letters) is placed 200 yards **SE.** of the outer rock; it should be left on the port hand by vessels entering.

Trundy Reef extends about ⅞ mile northeastward from Trundy Point, the point 2¼ miles south from Portland Head Lighthouse. For ¼ mile from the point the reef shows bare at low water, and outside of this it has 11 to 17 feet over it. A buoy (can, black, "T. R." in white letters) is placed east of the northern end of the reef and bears **S.** by **E.** ¼ **E.**, distant about 1¾ miles from Portland Head Lighthouse.

Willard Rock and **Pine Tree Ledge** are described under section 1 A. **Jordan Reef** is described under section 1.

2. *Entering, and to an Anchorage.*—*I.* Standing for Spring Point Ledge Lighthouse on a **N.** by **W.** course, leave the red bell buoy and red spar buoy off the southwest end of Cushing Island about 200 yards on the starboard hand. When the lighthouse is about ½ mile distant ahead steer **N.** by **E.**, and anchor when Portland Breakwater Lighthouse bears *W.*, about ¼ mile southward of Fort Gorges, within the anchorage limits prescribed in the harbor regulations in Appendix II.

II. Bound to the Quarantine Anchorage.—Follow the directions in the preceding paragraph, and when Spring Point Ledge Lighthouse is ½ mile distant ahead haul eastward and anchor in about 6½ fathoms, ¼ mile *SW.* from House Island.

III. Bound into the Upper Harbor.—Follow the directions in paragraph I preceding; pass 250 yards eastward of Spring Point Ledge Lighthouse, and when it bears *W.* steer **NNW.** and leave black spar buoy No. 3 nearly 200 yards on the port hand. When Portland Breakwater Lighthouse bears *WSW.* steer **W.** by **N.**, and when the lighthouse bears *S.* by *E.* haul southwestward and stand into the harbor, giving the wharves a berth of 200 yards. Anchor on the eastern side of the channel within the limits prescribed in the harbor regulations in Appendix II.

Remarks.—When the course is changed to **N.** by **E.**, the eastern angle of **Fort Gorges**, a granite structure with base in the water, will be ahead; **House Island**, at the southwestern end of which is **Fort Scammel**, will be broad on the starboard bow and **Fort Preble** opposite on the port bow; **Fish Point**, the eastern point of the peninsula on which the city of Portland is built, will be seen just northward of Fort Preble. **Portland Breakwater** and the lighthouse at its end will be opened from behind Fort Preble, and the city of Portland will be opened westward. The hotels and summer houses on Peaks Island will show conspicuously between Cushing and House islands; they will be shut out by House Island and opened again when past the latter. **Diamond Island Roads** lie on the eastern side of the channel between Fort Scammel and Fort Gorges.

Dangers.—Shoals make out 350 yards, in some places, from the eastern shore of Cape Elizabeth abreast Cushing Island.

Mill Rock is a detached ledge, with 2 feet of water over it, lying about 150 yards northeastward of the southern point of **Simontons Cove**, the cove on the Cape Elizabeth shore south of Fort Preble. A buoy (spar, black, No. 1) is placed northeastward of the rock.

Shoals extend about 130 yards westward from the southwestern point of Cushing Island. **Catfish Rock**, one of these, is marked by a buoy (spar, red, No. 2). The shoals extending about 350 yards northward from the north side of Cushing Island are marked on their western edge by two red spar buoys, Nos. 4 and 6.

Spring Point Ledge makes out about 350 yards in a **NE.** by **N.** direction from Spring Point, the point on which Fort Preble is built. This ledge shows partly bare at three-quarters ebb, and is marked near its end by a lighthouse.

Staniford Ledge makes off from the northern point of Cape Elizabeth. Portland Breakwater, with a lighthouse on its end, is built on the ledge, and extends out to the 6-foot curve. The shoal, with less than 18 feet over it, extends about 250 yards eastward and northward of the lighthouse. A buoy (spar, black, No. 3), lying 600 yards **E. ¼ N.** from the lighthouse, marks the edge of the deep-water channel; and a buoy (spar, black, No. 5), 250 yards **N. ¼ W.** from the lighthouse, marks the edge of this channel where it turns into the Inner Harbor.

Diamond Island Ledge is the large ledge, showing partly bare, on the southern side of which Fort Gorges is built. The ledge extends about 400 yards westward of the fort and 600 yards northeastward of it.

A **shoal**, with 14 to 17 feet over it, lies north of House Island in Diamond Island Roads. To avoid this shoal when standing into Diamond Island Roads, keep the southwestern end of House Island bearing eastward of **S.** until Portland Breakwater Lighthouse bears southward of **W. ¼ N.**

Shoals make out from the Cape Elizabeth shore abreast the city of Portland, and a short distance below the drawbridge the channel has a width of 150 yards.

COAST FROM CAPE ELIZABETH TO PORTSMOUTH, N. H.*

This stretch of coast extends about 37 miles in a general **SW.** direction from Cape Elizabeth, with but few harbors indenting it, they being principally the resort of fishermen and small coasters seeking shelter in bad weather. The principal harbors are treated separately under their respective headings. Richmonds Island Harbor (see heading) is the only anchorage that can be used by vessels of over 12 feet draft, but it is exposed to southeasterly and southerly winds.

*Shown in parts on charts **107, 108**, scale $\frac{1}{80,000}$, price of each $0.50.

Between Richmonds Island and Wood Island Lighthouse, a distance of 6¼ miles, the shore has a more westerly trend, and forms a large open bight, the southern part of which is **Saco Bay**. **Prouts Neck**, a prominent point, nearly 3 miles west from Richmonds Island, is the northern point of Saco Bay. The shore of the bay is known as **Scarboro Beach**, **Old Orchard Beach**, and **Ferry Beach**, in the order named from northward. The large hotels at Old Orchard Beach form a prominent landmark for vessels passing near the coast. **Stratton** and **Bluff** islands lie in the entrance of Saco Bay about 2¾ miles **NNE. ½ E.** from Wood Island Lighthouse; they are connected by shoals and rocks, but there is good water between them and Prouts Neck. In the southern end of Saco Bay is the entrance to **Saco River** and the small anchorage known as Wood Island Harbor (see heading "Saco River and Wood Island Harbor").

Between Wood Island Lighthouse and Goat Island Lighthouse, a distance of 7¼ miles, the shore has a general **SW. ½ W.** trend, and is broken by a number of small unimportant coves. **Timber Island**, about 2½ miles **NE. ½ N.** from Goat Island Lighthouse, is the northern point of **Goose Fair Bay**, a shallow cove full of rocks and ledges. **Cape Porpoise** is the easternmost of the islands lying north of Goat Island Lighthouse; it is also known as **Cape Island**. **Stage Island Harbor** is a small slough northwestward of Cape Island that is used as a harbor of refuge by fishermen and small local craft. Cape Porpoise Harbor, ½ mile southwestward of Cape Island, is described under a separate heading.

Between Goat Island Lighthouse and Cape Neddick Lighthouse, a distance of 13¾ miles, the shore is broken by a number of small shallow streams, the most important of which is Kennebunk River (see heading). The trend of the coast for a distance of about 5 miles is **W.** from Goat Island Lighthouse, and forms a broad open bight, the shore of which is known as **Wells Beach**.

The village of **Ogunquit**, a part of the township of Wells, is at the southern end of the beach. **Bald Head Cliff** is a high, prominent point about 3½ miles **NNE. ½ E.** from Cape Neddick; just northward of the latter is a small anchorage known as Cape Neddick Roads, which is sometimes used by small local craft in fine weather.

Cape Neddick is a prominent headland extending out about 1 mile from the main shore; off its eastern end is a small islet, **Cape Neddick Nubble**, on which is **Cape Neddick Lighthouse**. A little over 5⅝ miles **SE. ½ E.** from Cape Neddick Lighthouse is **Boon Island Lighthouse**, situated on a small, rocky islet. This is one of the important offshore lighthouses on the coast of Maine, and can be left on either hand by passing vessels; those bound eastward of the lighthouse either give it a berth of ¼ to 1¼ miles, or they pass at least 3½ miles eastward to avoid Boon Island Ledge, which has 3 feet over it and is marked by a whistling buoy. There are two spots with 4½ and 5 fathoms over them a little eastward of halfway between the island and the ledge. Passing westward of Boon Island Lighthouse it should be given a berth of at least 1¼ miles to avoid Pollock Rock.

Between Cape Neddick Lighthouse and the entrance to Portsmouth Harbor, a distance of a little over 8¼ miles, the shore has no marked indentations except York River entrance (see heading). Lying offshore about 2½ miles are two dangerous ledges; the northernmost of these bears **SE.** by **S.** from York River entrance, distant about 2¾ miles. There are spots with 3¼ to 6 fathoms over them between the southernmost ledge (Murrays Rock) and the mainland. **York Beach** is between Cape Neddick and York River entrance; it is a much frequented summer resort and has several large hotels and a number of summer cottages a short distance from the shore.

RICHMONDS ISLAND HARBOR.*

This harbor, which is formed by the northern shore of Richmonds Island and a breakwater from the island to the mainland of Cape Elizabeth, is about 2½ miles southwestward of Cape Elizabeth Lighthouses. It affords anchorage with shelter from winds from **W.** to **SE.** through **N.**, and is sometimes used by vessels bound to Portland when they can not enter that harbor on account of a head wind. The entrance between the western point of Richmonds Island and **Ram Island**, a small island near the southern shore of Cape Elizabeth, is about ⅛ mile wide and has a depth of 5 to 8 fathoms. This depth gradually decreases in a northeasterly direction toward the head of the harbor, where it ranges from 10 to 24 feet. The bottom is sand and clay. The principal dangers are marked by buoys, and in clear weather in the daytime the anchorage may be made by large vessels. On indications that the wind will veer southward of **E.** vessels should stand out of the harbor. The mean rise and fall of tides is 8.6 feet.

*Shown on charts **106**, **107**, scale $\frac{1}{80,000}$, price $0.50; **327**, scale $\frac{1}{20,000}$, price $0.20.

SAILING DIRECTIONS, RICHMONDS ISLAND HARBOR.

1. *Approaching from Eastward.*—When northward of West Cod Ledge, shape a course so as to pass about 1 mile eastward of Cape Elizabeth East Lighthouse. Leave Taylor Reef buoy (can, black, "T. R." in white letters) ¼ to ½ mile on the starboard hand and steer **SW.** by **W.** ½ **W.** When the western end of Richmonds Island bears *NW.* by *W.*, steer about **WNW.** and round the western point of the island, giving its south shore and western point a berth of about ⅜ mile. When Cape Elizabeth Lighthouses bear about **ENE.** ½ **E.**, steer for them on this bearing and anchor in 4 to 8 fathoms water, when the western point of the island bears southward of *SE.*

Beating in to the anchorage, give the southern and western shores of Richmonds Island a berth of about ¼ mile. When standing westward beware of Old Proprietor, and do not approach the shore of Cape Elizabeth between Prouts Neck and the entrance of the harbor closer than 1 mile. Standing into the harbor the northern shore should not be approached closer than ⅜ mile to avoid Chimney Rock. When past this rock an **E.** by **N.** course will lead to the head of the harbor in about 4 fathoms water.

Remarks and dangers.—Wood Island Lighthouse kept bearing westward of **SW.** ½ **S.** will clear the ledges making eastward from Stratten Island and also Old Proprietor.

Old Proprietor is a ledge showing bare at half tide; it lies a little over 1¾ miles **W.** ¾ **N.** from the western end of Richmonds Island and is marked off its southeastern end by a buoy (spar, black, No. 1). Nearly ½ mile **NNE.** from Old Proprietor is a shoal spot with 11 feet over it.

Chimney Rock is awash at low water and lies ⅜ mile **NNW.** ½ **W.** from the western point of Richmonds Island. A buoy (spar, black, No. 3) is placed off the southeastern side of the rock, which is left on the port hand when entering.

The Brothers are three small, bare rocks surrounded by ledges about 300 yards **NE.** by **N.** from Chimney Rock; they are not in the way of vessels entering, but vessels anchoring in the northern part of the harbor should be careful to avoid them and a **11-foot spot** lying 400 yards **ENE.** from the buoy marking Chimney Rock.

There is a spot with **16 feet** over it about 400 yards **ESE.** ½ **E.** from the buoy marking Chimney Rock.

1A. *Approaching from Southwestward.*—Keep at least 1¼ miles eastward of Fletchers Neck and Wood Island Lighthouse. When northward of the lighthouse bring it to bear *SW.* ¼ *W.* and steer **NE.** ¼ **E.**; this course will lead a little over ¾ mile eastward of Stratten Island, about 1 mile eastward of Old Proprietor, and up to the anchorage in the harbor.

See also the directions for beating and the remarks and dangers under section 1, preceding.

SACO RIVER AND WOOD ISLAND HARBOR.*

This is a narrow, crooked stream with a least depth of 3½ feet in the channel at low water; it extends in a northwesterly direction about 3½ miles to the cities of **Biddeford** and **Saco**, the former on the south bank of the river and the latter opposite on the north bank. Above the cities the river is not navigable for vessels of any size. The entrance is marked by **Wood Island Lighthouse** (see table, page 20) which bears **SW.** by **W.**, distant 8½ miles from Cape Elizabeth Lighthouses, and **NE.** ½ **E.**, distant 7¼ miles from Goat Island Lighthouse; it is much obstructed by rocks, ledges, and small islands, between which is a small anchorage called **Wood Island Harbor.** Many of the dangers are marked, but a stranger should not attempt to enter the river without a pilot or towboat.

The deepest draft vessels that enter here is 12 feet; 9 to 10 feet is the usual draft. There is from 4 to 10 feet of water alongside the wharves at low water. The channel has 3½ feet of water on the bar at low water and is very narrow and crooked. The only **anchorage** is off the mouth of the river in Wood Island Harbor. This has from 13 to 21 feet of water, but is small and exposed to easterly winds. The best shelter is just northward and westward of Philip Rock spindle.

Wood Island Harbor is southward of Wood Island. Between it and Fletchers Neck it is very narrow, but frequented by fishermen in bad weather, who sometimes lie here so close as to make fast to one another. There are numerous rocks off the entrance and in the harbor; the principal ones are marked.

*Shown on charts **106, 107,** scale $\frac{1}{80,000}$, price of each $0.50.

The Pool, or Biddeford Pool, is a shallow bay making southwestward inside of Fletchers Neck. The entrance is very narrow and entirely unfit for a stranger to enter, although light-draft vessels well acquainted with the locality sometimes anchor just inside.

Pilots.—Strangers entering Wood Island Harbor or bound into the river should take a pilot; vessels usually signal 1 to 2 miles from Wood Island Lighthouse and pilots come out to them.

Towboats.—Vessels bound into the river take a towboat, which will be found near the entrance; if over 400 tons capacity, a pilot should be employed in addition to the towboat to steer the vessel up the river. Those of less than 400 tons capacity generally are taken up by the tug without a pilot.

Supplies.—A limited quantity of anthracite and bituminous coal for steamers can be obtained alongside the wharves at Biddeford and Saco. Fresh water can be taken from the river at Saco. Provisions can be had in either city.

Ice closes the river from January to April each year.

Tides.—The mean rise and fall of tides is 8.9 feet. See also the table on page 27.

SAILING DIRECTIONS, TO THE ANCHORAGE IN WOOD ISLAND HARBOR.

These directions are good for a draft of 9 feet or less in the daytime and in fine weather. In bad weather this harbor is usually crowded with small coasters and fishermen, so that it would be difficult for a stranger to get a berth. Vessels bound into Saco River can take a pilot or towboat from the anchorage in Wood Island Harbor.

1. ***Approaching and Entering, from Northeastward.***—When Cape Elizabeth Lighthouses bear eastward of *N.*, steer for Wood Island Lighthouse bearing between **SW.** by **W.** ½ **W.** and **W.** When 1 mile distant from the lighthouse, steer more westward so as to pass ½ mile northward of Wood Island. Then bring the monument on Stage Island to bear **WSW.**, and steer for it on this bearing, passing about midway between Negro Island Ledge buoy (spar, black, No. 1) and Ram Island Ledge buoy (spar, red, No. 2). When about ½ mile distant from the monument, change course to about **SW.** by **S.** so as to leave Stage Island Shoal buoy (spar, black, No. 3) about 150 yards on the starboard hand, and Negro Island Bar buoy (spar, red, No. 4) about 150 yards on the port hand. Anchor about midway between Negro (Tappan) Island and Stage Island, in 15 to 18 feet, soft bottom.

Remarks.—Approaching Wood Island Lighthouse **Fletchers Neck** will be seen southward and a number of small islands westward. **Negro (Tappan) Island** is a small, rocky islet about 200 yards westward of Wood Island; between this island and **Stage Island,** the next island westward and marked at its northeastern end by a stone monument, is the anchorage known as Wood Island Harbor. Northwestward from Stage Island monument are the breakwaters and entrance to Saco River. The village on Fletchers Neck, "**Biddeford Pool,**" is southwestward of the anchorage.

Dangers.—**Ram Island Ledge** is about 450 yards long in an **E.** and **W.** direction and has a depth of 9 feet over it. A buoy (spar, red, No. 2) is placed about 50 feet south of the ledge near its eastern end and bears **NW.** ¾ **N.** from Wood Island Lighthouse, distant about ⅛ mile.

Negro Island Ledge is about 150 yards in diameter and has a depth of 9 feet over it; off its northeastern side it is marked by a buoy (spar, black, No. 1) which bears **NW.** ¾ **N.**, distant ¼ mile from Wood Island Lighthouse.

Negro Island Bar is a shoal making out about 350 yards southwestward from Negro (Tappan) Island; at its southwestern point it is marked by a buoy (spar, red, No. 4) which is colored and numbered for the passage south of Wood Island.

Stage Island Shoal is a dangerous reef which makes out about 300 yards **ENE.** from the northeastern point of Stage Island, and is bare for more than half its length at low water; it is marked at its end by a buoy (spar, black, No. 3). The flood current sets across this reef, and vessels should give the northeastern point of Stage Island a berth of 350 yards to clear it.

Sharps Rocks show bare at half tide, and lie a little over ⅝ mile **N.** by **W.** ¼ **W.** from the monument on Stage Island. A buoy (spar, red, No. 6) is placed southward of the rocks, which extend about 350 yards in an **E.** by **S.** and **W.** by **N.** direction. This buoy is left on the starboard hand by vessels bound up Saco River.

1 A. ***Approaching and Entering, from Southward.***—When about 2 miles southward of Wood Island Lighthouse bring it to bear **N.** ⅛ **W.** and steer for it on this bearing. Dansbury Reef buoy should be made a little on the starboard bow and left about 150 yards on the starboard hand. When this buoy bears *E.* steer **NNW.** and pass about

175 yards eastward of the northeastern point of Gooseberry Island. When the point bears *SW.* steer **WNW. ½ W.**, keeping Negro Island Bar buoy a little on the starboard bow. When abreast of this buoy, which should be left about 60 yards on the starboard hand, steer more northward and anchor about midway between Negro (Tappan) Island and Stage Island in 15 to 18 feet, soft bottom.

Remarks.—Standing for Wood Island Lighthouse on the **N. ⅛ W.** course, Fletchers Neck and the life-saving station on its eastern side will be on the port bow. When abreast Dansbury Reef buoy Washmans Rock will be left about 200 yards on the port hand. **Gooseberry Island**, lying south from the western end of Wood Island, is left on the port hand; the channel leads between the two islands. On the **WNW. ⅛ W.** course the monument on Stage Island will be on the starboard bow and the southern end of **Basket Island**, small island westward of Stage Island, will be ahead. When standing northward, after having passed Negro Island Bar buoy, care should be taken not to be set on to Stage Island Point.

Dangers.—**Hussey's Rock** has 7 feet over it and lies nearly 1⅝ miles **SW.** by **S.** from Wood Island Lighthouse; it is marked by a buoy (spar, black, No. 1) placed 900 yards south from the rock, and a short distance south from a 19-foot spot.

A number of **rocks** and **ledges** extend about ⅝ mile eastward and southeastward from Fletchers Neck, abreast the life-saving station. **Beach Island**, a small, low islet, and **Whales Back**, a ledge with 3 feet over it, are the most prominent of these dangers. Vessels coming from southward avoid these by keeping Wood Island Lighthouse bearing westward of **N.**

Washmans Rock is a bare rock lying 400 yards **SE.** by **E. ½ E.** from the eastern point of Fletchers Neck; it should be left at least 100 yards on the port hand by vessels entering.

Dansbury Reef has a depth of 5 feet over it and lies about ⅛ mile **S. ¾ E.** from Wood Island Lighthouse. At its southern end is a buoy (spar, red, No. 2) which should be left on the starboard hand by vessels entering. There are several shoal spots between the reef and Wood Island, and strangers should not enter between them.

There are several half-tide rocks lying off the northern shore of Fletchers Neck westward of Gooseberry Island. These can be avoided by giving the shore a berth of at least 350 yards until up to Negro Island Bar buoy.

Half-tide Rock lies about ⅜ mile **S.** from the monument on Stage Island and on the south side of the slough leading into Biddeford Pool.

CAPE PORPOISE HARBOR.*

This is a small, narrow, and irregular inlet lying between the islands and rocks westward of Goat Island Lighthouse. It is used as a harbor of refuge by fishermen, who, during bad weather, occupy practically the whole of the harbor. The channel at the entrance is 200 feet wide and has a depth of 16 feet. The anchorage has a depth of 15 feet and is 600 feet wide; the smaller vessels sometimes anchor on the flats on the western side of the channel, where they lie aground in the soft mud at low water. Vessels of over 100 tons should not attempt to enter the harbor for refuge on account of the small area of the anchorage; it is advisable for strangers to run either for Portland or Portsmouth if caught in a blow. Vessels of 18 feet draft loaded with coal have been brought into the harbor. Vessels of 9 feet or less draft may stand into the anchorage by closely following the directions, but vessels of deeper draft should take a pilot.

GENERAL DIRECTIONS, CAPE PORPOISE HARBOR.

When Goat Island Lighthouse is about ¾ mile distant bring it to bear **N.** by **W. ½ W.** and steer for it on this bearing. Old Prince buoy (nun, red, No. 2) should be made on the starboard bow and left about 50 yards on the starboard hand; when this buoy bears about *E.* steer **NW. ¾ N.** and pass close to Goat Island Point buoy (spar, red, No. 4), leaving it on the starboard hand. Continue the **NW. ¾ N.** course about 200 yards past red spar buoy No. 4 and then steer about **N. ¼ W.**, leaving black spar buoy No. 1 on the port hand, and following the channel which here forms the anchorage. Anchor in 15 feet of water, or, if of light draft and the tide will permit, stand westward and anchor on the flats so as to lie aground at half tide.

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*Shown on chart **107**, scale $\frac{1}{80,000}$, price $0.50.

KENNEBUNK RIVER.*

This is a small stream about 2¾ miles westward of Cape Porpoise; it is the approach by water to Kennebunkport, but is of little commercial importance. The entrance is between two stone piers that were built to improve the channel, which has a depth of 3 feet at low water. Vessels of 12 feet draft are sometimes taken to the wharves of the town at high water under favorable conditions. There is no anchorage off the entrance that affords shelter; the **Fishing Rocks** are a dangerous obstruction to the approach. Strangers should not attempt to enter the river without a pilot; when approaching the entrance, signal should be made for one and the vessel kept at least 1 mile offshore until boarded.

The town of **Kennebunkport** is at the head of navigation, about ¾ mile above the entrance of the river. A limited amount of anthracite coal, water, and provisions can be had at the wharves of the town, alongside of which there is a depth of 5 feet at low water.

Sailing directions of practical value for entering the river can not be given.

YORK RIVER.†

This river is the approach by water to **York Village**; it is sometimes used as a harbor of refuge by small coasting and fishing vessels, but the anchorage is small and difficult of access, and a stranger should not enter without a pilot. The entrance, between East Point on the north and Argo Point on the south, lies about 2¼ miles southwestward of Cape Neddick and is somewhat obstructed by ledges which are marked by buoys. Inside the entrance the prominent dangers are marked by buoys up to Stage Neck, but above this there are no aids. The channel is narrow and crooked and the tidal currents run with great velocity, the ebb nearly 5 miles and the flood nearly 3¼ miles at strength during spring tides. There is about 8 feet at low water in the channel, and the deepest draft taken to York Village, about ⅞ mile above the mouth of the river, is about 15 feet; 9 feet is the deepest draft that can be taken to Scotland, at the head of navigation. Three bridges cross the river above the village; the width of the draws is 27 to 30 feet.

Pilots for York River can be obtained by making signal outside the entrance and lying off and on until boarded. The most favorable time for entering is on the flood tide.

Ice closes the river to navigation in severe winters.

The mean rise and fall of the tide is about 8¼ feet.

SAILING DIRECTIONS TO THE ENTRANCE OF YORK RIVER.

1. ***From Northward and Eastward.***—When Cape Neddick Lighthouse is made, shape a course so as to pass about 1 mile southeastward of it. When the lighthouse bears *NW.*, distant 1 mile, steer **SW.** by **W.** ¼ **W.** about 2¼ miles, leaving East Point Ledge buoy (spar, red, No. 2) about ⅜ mile on the starboard hand. The entrance to the river will then be opened and a stranger should take a pilot outside this buoy.

Or, having passed about 1 mile northward of Boon Island Lighthouse, bring it to bear *ESE.* ½ *E.* astern and steer **WNW.** ½ **W.**, keeping the bearing. When nearly ¼ mile south of East Point Ledge buoy (spar, red, No. 2) take a pilot. The entrance will be directly ahead.

1 A. ***From Southward and Southwestward.***—Pass at least 1½ miles eastward of the Isles of Shoals, and when Duck Island, the northernmost island, with a large tripod beacon, bears *W.*, distant 1½ miles, steer **N.** ¼ **W.** Leave Murrays Rock buoy (nun, red and black horizontal stripes) ½ mile on the port hand and York Ledge Spindle about the same distance on the starboard hand. East Point should be ahead; when the point is distant about ¾ mile the buoys at the entrance will be made on the port bow and a pilot should be taken.

Or, standing alongshore, when eastward of Whaleback Lighthouse, at the entrance to Portsmouth Harbor, stand northeastward, giving the shore a berth of ¾ mile to 1¾ miles. As soon as Cape Neddick Lighthouse is made, steer **NNE.** ¾ **E.**, heading for it on this course, and when York River entrance is open on the port beam take a pilot.

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*Shown on chart **107**, scale $\frac{1}{80,000}$, price $0.50.

†Shown on charts **108**, scale $\frac{1}{80,000}$, price $0.50; **328**, scale $\frac{1}{20,000}$, price $0.15.

Remarks.—**East Point**, the northern point at the entrance, has a number of summer houses. A large yellow hotel on the south side of the river and some distance back from the beach forms a conspicuous mark to recognize the entrance.

PISCATAQUA RIVER AND PORTSMOUTH HARBOR.*

This harbor, lying about 37½ miles **SW. ¼ W.** from Cape Elizabeth and about 25 miles **N.** from Thatcher Island (Cape Ann Lighthouses), is the only harbor of refuge for deep-draft vessels between Portland, Me., and Gloucester, Mass. The entrance is marked by **Whaleback Lighthouse** and fog signal (see table, page 22), and the most prominent outlying dangers are marked, so that no difficulty should be experienced when entering in clear weather, either in the daytime or at night. **Portsmouth Harbor** is formed by the mouth of the Piscataqua River, and is the approach to the cities of Portsmouth and Dover and the towns of Newcastle, Kittery, South Newmarket, and Exeter; on the north side of the harbor, opposite the city of Portsmouth, is the United States Navy Yard.

The Piscataqua River has several branches, the principal ones being the **Cocheco River**, and **Great Bay** and **Exeter River**, also known locally as the "Exeter and South Newmarket Branch." These are navigable at high water for vessels up to 10 feet draft, but a towboat and local knowledge are necessary. On the western side of the entrance, about **W. ¼ S.** from Whaleback Lighthouse, is the entrance to **Little Harbor**, which is treated under a separate heading.

The city of **Portsmouth** has a large trade in coal, carried principally in the larger coasting vessels and barges, which are taken alongside the wharves from the anchorage by towboats; it is connected with the town of Kittery by a drawbridge. The **least depth** in the channel entering the harbor is about 6½ fathoms, but above Fort Constitution the depths range from 8 to 12½ fathoms and the tidal currents have great velocity. Vessels of 23 feet draft can lie afloat at the principal wharves in the city.

Kittery is a small town on the north side of the harbor opposite Portsmouth; it is connected with the Navy Yard, which is on an island, by a drawbridge. The town is of no commercial importance, almost everything used being brought from Portsmouth.

Newcastle is a village on the south side of the harbor westward of Fort Constitution; it is of no importance, and is reached from Portsmouth by crossing several bridges which connect the islands on the south side of the harbor.

Dover is an important manufacturing city on the Cocheco River, about 12 miles above the city of Portsmouth; coal is brought to the city at high water in vessels of 10 feet draft. The channel is narrow and crooked, and requires local knowledge and the assistance of steam. There is about 4 feet of water alongside the wharves at low water, and the mean rise of tides is about 6½ feet. A bridge with a draw about 35 feet wide has to be passed just above the city of Portsmouth.

South Newmarket and **Exeter** are two manufacturing towns on the Exeter River, the former about 17 miles and the latter 22 miles above the city of Portsmouth; they have some trade in coal and can be reached at high water by vessels of 10 feet draft. The channel through Great Bay and in the Exeter River is narrow and crooked, and is navigable only for vessels assisted by steam. Three bridges have to be passed; the least width of the draws is about 30 feet. Vessels when loaded must lie aground at the wharves at low water.

Prominent features.—Boon Island and Isles of Shoals lighthouses are the offshore aids lying eastward of Portsmouth entrance. **Mount Agamenticus**, 728 feet high and the most prominent landmark in this vicinity, is about 10 miles **N.** by **E.** from Portsmouth Harbor entrance. A large white hotel with a red roof, on the north side of Little Harbor and west side of Portsmouth entrance, is a prominent feature when approaching from southward. **Whaleback Lighthouse** is on the eastern side at the entrance. **Portsmouth Harbor (Newcastle) Lighthouse** (see table, page 22) is on the western side of the harbor, above Whaleback Lighthouse, where the channel makes a sharp bend westward. **Fort Constitution** is the brick and granite structure near Portsmouth Harbor Lighthouse.

Pilots.—There are no branch pilots for Portsmouth Harbor; vessels, if bound to any of the towns on the Piscataqua River or its branches, take a towboat from the anchorage. A pilot is not necessary in clear weather when the aids can be seen. For pilotage laws see Appendix II.

Towboats are on the lookout for vessels expected to arrive, and if the tide is slack will tow alongside the wharves without any delay. A vessel desiring a towboat while outside Whaleback Lighthouse can obtain one by making the usual signal (flag in rigging).

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*Shown on charts **108**, scale $\frac{1}{80,000}$, price $0.50; **329**, scale $\frac{1}{20,000}$, price $0.20.

Anchorages.—The anchorage is anywhere on the east and north sides of the channel between **Wood Island**, the island north of Whaleback Lighthouse, and **Clarks Island**, the small island on the north side about ¼ mile above Fort Constitution, in 8 to 11 fathoms. With a southerly wind the best anchorage is above Fort Constitution on the south side of the channel, in 8 to 10 fathoms, bottom generally clay. There is no anchorage above Clarks Island, except for small craft. Just westward of Seavys Island and close to the Navy Yard is a small anchorage, but care must be taken not to foul the moorings which extend out some distance from the Navy Yard, and from the large mooring buoys.

Harbor regulations.—The harbor master of the city of Portsmouth has authority to regulate any controversy among the vessels in the harbor (see Harbor Regulations, Appendix II).

Quarantine regulations.—The board of health of the city of Portsmouth has jurisdiction over the harbor of Portsmouth (see Quarantine, Appendix II).

Marine Hospital.—Medical attendance is furnished seamen by an acting assistant surgeon of the United States Public Health and Marine-Hospital Service, under regulations for stations of Class III (see Appendix IV).

Supplies.—Coal can be obtained at the wharves, water from a water boat or alongside the wharves, provisions and a limited supply of ship-chandler's stores in the city of Portsmouth.

Repairs.—There is one small marine railway at Kittery, Me.; its capacity is limited to small craft. Sailing vessels and steamers requiring repairs to hull or machinery usually go to Portland or Boston.

Storm warning displays of the United States Weather Bureau are made from a building corner of Daniel street and Market square, and can be readily seen by the shipping in the harbor. Displays are also made at the life-saving station on Jaffray (Jerrys) Point, at the entrance to the harbor about 1 mile south of Fort Constitution.

Ice.—In ordinary winters Portsmouth Harbor is free from ice, but during severe winters there is considerable drift ice which comes down the river with the ebb current; it is seldom an obstruction to navigation and never interferes with vessels at anchor below Clarks Island.

Tidal currents.—The tidal currents have great velocity and require special care. It is slack water about 2 hours after high and low waters and the duration of the stand is about 10 minutes. The current attains its maximum velocity about 1 hour before high and low waters. The mean maximum velocity of the flood and the ebb current, above Fort Constitution, is about 3 miles; but during spring tides it is much greater, probably 6 miles.

Tides.—The mean rise and fall of tides is 9.2 feet; see also table, page 27.

SAILING DIRECTIONS, PORTSMOUTH HARBOR.

These directions, if closely followed, will lead to the anchorage with a least depth of 6½ fathoms; this depth is found in spots in the channel westward and southwestward from Whaleback Lighthouse. Sailing vessels passing above the anchorage should take a towboat.

1. ***Approaching and Entering, from Northward or Northeastward.***—Standing along shore as directed in section 5, page 36, and having passed about 1¾ miles westward of Boon Island Lighthouse, continue the **SW. ¼ W.** course until Whaleback Lighthouse bears *WNW.*, and then steer **W.** by **N.** This course should lead a little over ¼ mile southward of the bell buoy off Kitts Rocks. Leave the bell buoy over ¼ mile on the starboard hand and stand westward until Portsmouth Harbor (Newcastle) Lighthouse bears **N. ⅜ W.**, when it should be steered for on that bearing.

When Whaleback Lighthouse is well abaft the starboard beam, bearing *SE.* by *E.*, change course to about **N.** by **E.** so as to pass about 350 yards eastward of Portsmouth Harbor Lighthouse, and when the latter bears well abaft the port beam steer between **N.** by **W.** and **NW.** and anchor on the north side of the channel in 8 to 13 fathoms water, clay bottom.

If a steamer, and bound to Portsmouth, follow the directions in section 2.

Remarks.—On the **SW. ¼ W.** course, when Whaleback Lighthouse bears **WNW.**, Murrays Rock buoy should be distant about 1½ miles on the starboard quarter. To avoid the dangers eastward of Whaleback, give the shore a berth of 1 mile. The red fog-signal structure close to Whaleback Lighthouse is a prominent mark in the daytime. Entering on the ebb current care should be taken not to be set eastward too close to

Whaleback and Wood Island. The bell buoy tails eastward on the ebb and northwestward on the flood. On the **N.** by **E.** course Stielman Rocks buoy will be left about 400 yards on the port hand. **Fort Constitution**, a low brick and granite structure, will be seen close to Portsmouth Harbor Lighthouse. In light winds vessels should not stand too close to Portsmouth Harbor Lighthouse.

Dangers.—**York Ledge** and **Murrays Rock** are described on page 36. A number of rocks and ledges, some of them showing bare at low water, extend in a broken line about 1½ miles eastward of Whaleback Lighthouse and about ¾ mile from the shore. They are known, respectively, as the **East Sister, West Sister, Phillips Rocks, White Island Reef,** and **Kitts Rocks,** and are avoided by giving the shore a berth of 1 mile. A buoy (spar, red, No. 2) is placed 300 yards southeastward of the **West Sister** and bears **E.** by **S.**, distant nearly 1¼ miles from Whaleback Lighthouse. A bell buoy is placed ⅝ mile southward of Kitts Rocks and bears **S.** by **E.** from Whaleback Lighthouse, distant nearly ¾ mile.

Stielman Rocks are about 400 yards from the shore southward of Portsmouth Harbor Lighthouse; a buoy (can, black, No. 3) is placed on the eastern end of the rocks. The shore between the entrance to Little Harbor and this buoy should be given a berth of over 350 yards by deep-draft vessels.

Shoals make out 250 yards westward from Wood Island.

Fishing Islands are two small, rocky islets lying on the north side of the channel **NE.** from Portsmouth Harbor Lighthouse. **Fishing Island Ledge** is bare at low water and extends westward from the islands. A buoy (spar, red, No. 4) is placed off the western end of the ledge.

Cod Rock has 16 feet over it and lies about 200 yards **NW.** from Fort Constitution; it is marked by a buoy (spar, black, No. 5).

1 A. ***Approaching and Entering, from Southward.***—Bring Straitsmouth Lighthouse to bear *WSW.*, distant 2¼ miles, and steer **N.** ¼ **W.** about 22½ miles. This course will lead ¼ mile westward of White Island whistling buoy, 1½ miles westward of Isles of Shoals Lighthouse, and fair for Whaleback Lighthouse.

Or, from a position ¾ mile westward of Isles of Shoals Lighthouse, steer **N.** by **W.**, heading for Portsmouth Harbor Lighthouse, and so as to pass westward of the bell buoy off Kitts Rocks.

When the bell buoy is nearly abeam, bring Portsmouth Harbor Lighthouse to bear **N.** ⅝ **W.** and steer for it on this bearing; then follow the directions in section 1, preceding.

Remarks and dangers.—On the **N.** ¼ **W.** and **N.** by **W.** courses the entrance of the harbor is ahead; the large white hotel with red roof, on the western side of the entrance (north side of Little Harbor) will be the most prominent feature. See also the remarks and dangers under section 1, preceding.

Gunboat Shoal has a least depth of 3½ fathoms over it, and lies 2¼ miles **S.** by **W.** ¾ **W.** from Whaleback Lighthouse and about 1 mile from the shore. It is about ¼ mile long in a **NE.** and **SW.** direction, and is not marked. A good rule to follow is to give the shore southward of Gunboat Shoal a berth of at least 1½ miles, and when northward of the shoal to give the shore a berth of over ½ mile until nearly abreast the entrance to Little Harbor.

2. ***From Fort Constitution to the City of Portsmouth.***—*Note.*—Vessels should not go above Clarks Island unless they are sure of a berth at some wharf. The anchorage off the Navy Yard is small; there is no anchorage for large vessels; neither is there room for a vessel to turn in the channel when the current is running.

I. On the flood.—When Fort Constitution bears *S.*, distant 400 yards, steer about **W.** ¾ **N.**, heading for the southwestern point of Seavys Island,* and pass about midway between Clarks Island and the south shore, keeping in the axis of the current; a large standpipe on the southern side of Seavys Island will be on the starboard bow. When up to the southeastern end of Seavys Island, leave it about 100 yards on the starboard hand and steer so as to pass about 75 yards south of the southwestern point of the island, taking care to leave Goat Island Ledge buoy (can, black, No. 9) about 50 yards on the port hand.

Round the southwestern point of Seavys Island, and steer **NNW.** with Pumpkin Island beacon (red spar with diagonal braces and lozenge-shaped figure on top), which will be seen westward of the Navy Yard, on the port bow, permitting the current to set the vessel so she will slightly favor the shore of Pierces Island and keep out of the strong eddies off the southwestern side of Seavys Island. South Beacon Shoal buoy (spar, black, No. 11) should

* The southwestern point of Seavys Island was being leveled in September, 1902.

be left 150 yards on the port hand, and when it is abaft the beam, steer about **WNW.** ½ **W.** for the coal wharves at the upper part of the city, passing nearly 200 yards south of Pumpkin Island beacon and keeping out of the eddies on both sides of the channel.

II. On the ebb.—Steer about the same courses as in entering on the flood, care being taken to keep in the axis of the current, so as to meet it head on. Passing south of Seavys Island and rounding its southwestern point, great care is necessary as the current here is very strong, and if a vessel should take a sheer she would be likely to be set upon Goat Island Ledge (known also as Pull-and-be-damned Point) before she could be straightened to meet the current head on.

Dangers.—**Goat Island Ledge,** known also as **Pull-and-be-damned Point,** makes off about 150 yards northward from the eastern end of Goat Island. It is marked on its northern end by a buoy (can, black, No. 9). This ledge is particularly dangerous on the ebb current, which sets directly on it. The buoy sometimes tows under water during the strength of the current.

South Beacon Shoal extends about 160 yards eastward from the stone beacon, with mast and shape on top, which is on the south side of the harbor, southwestward from the Navy Yard. The northeastern edge of the shoal is marked by a buoy (spar, black, No. 11). About 70 yards north of the beacon is a 17-foot spot, and **Gangway Rock,** with a depth of 3¼ fathoms over it, lies 180 yards **NE.** by **N.** from the beacon.

Seward Rocks lie westward of the stone beacon on the south side of the harbor; they are marked near their northern side by a buoy (spar, black, No. 13).

The northern side of the harbor, between the Navy Yard and Willey Ledge spindle, is full of shoals, which extend about 125 yards southward of Pumpkin Island beacon.

LITTLE HARBOR.*

This is an excellent little harbor on the west side of the entrance to Portsmouth Harbor, and affords shelter for small craft and vessels of about 9 feet draft. Vessels should not attempt to enter in bad southeasterly weather, when the sea breaks across the entrance. The entrance, between two breakwaters, lies nearly ¼ mile **W.** by **S.** from Whaleback Lighthouse, and is marked by two buoys; the end of each breakwater is marked by a lighted beacon (see table, page 22).

The channel into the harbor has a depth of 12 feet for a width of about 150 feet, and a depth of 9 feet over the remaining width. Inside the south breakwater the width is about 300 feet, and the channel extends in a **W.** by **N.** direction for ⅜ mile; this forms the anchorage which has a depth of 12 feet and is marked on its northern edge by three red spar buoys.

The large white hotel with red roof, on the north shore of the harbor, is a prominent feature; but the entrance is easily recognized by the breakwaters which show at any stage of the tide.

GENERAL DIRECTIONS, LITTLE HARBOR.

Follow the directions in section 1 or 1 A, "Sailing Directions, Portsmouth Harbor," pages 192–193. On the **N.** ⅜ **W.** course for Portsmouth Harbor (Newcastle) Lighthouse, when the bell buoy off Kitts Rocks is about abeam, the cupola on the large white hotel will bear **NW.** ¼ **N.** and be nearly in range with the lighted beacon on the south breakwater. Steer for the beacon on the south breakwater on this course; leave red spar buoy No. 2 about 125 yards on the starboard hand, and when this buoy is abeam haul more northward so as to leave the end of the north breakwater 100 yards on the starboard hand.

When the end of the north breakwater bears *E.*, distant about 100 yards, steer about **N.** so as to leave the end of the south breakwater 75 yards on the port hand, and then haul westward. Leave black spar buoy No. 3 on the port hand, and steer about **W.** by **N.**

Anchor on the south side of the channel just inside the south breakwater, or anywhere in the channel about 150 feet southward of the line of red spar buoys Nos. 4, 6, and 8, which mark the northern edge of the channel.

* See footnote, page 191.

ISLES OF SHOALS.*

This group of islands lies from 5 to 6 miles offshore southeastward of Portsmouth Harbor entrance and about 20 miles **N.** ¾ **E.** from Thatcher Island (Cape Ann Lighthouses). It comprises seven islands and a number of rocks and ledges, many of which are bare at low water. The group extends about 3 miles **NE.** ½ **N.** and **SW.** ½ **S.**, and is marked at its southwestern end by **Isles of Shoals Lighthouse** (see table, page 22). There are several channels between the islands, but they are used only by local fishermen, who sometimes seek shelter there in easterly winds.

Duck Island, the northernmost of the group, is nearly 5¼ miles **SE.** ¾ **S.** from Whaleback Lighthouse at the entrance to Portsmouth Harbor; it is low, rocky, and surrounded by ledges, and should be given a berth of ¼ mile. In October, 1902, there was a large skeleton tripod beacon near the north end of the island.

Appledore Island, the largest of the group, lies about 1 mile southwestward of Duck Island; it is high and has a large summer hotel, the Appledore House, near the middle of the island, and a landing on its western side. The channel between Duck and Appledore islands has a depth of 10 to 15 fathoms except in one spot, where it is 6¾ fathoms. There is a small 7½-foot spot marked by a buoy (spar, black, No. 1) about 450 yards **W.** by **N.** from the northern end of the island. **Storm warning displays** of the United States Weather Bureau are made on the island, and are visible to passing vessels.

Smuttynose Island lies southward of Appledore Island, with a narrow channel between them having a depth of 3½ fathoms. There are several houses near the western end of this island and a small cove, **Haleys Cove**, where boats lie aground at low water.

Cedar Island is southward of Smuttynose, and is connected with it by a breakwater which is bare at low water; westward of this breakwater is **Gosport Harbor**, a small anchorage used by fishermen during easterly winds. It is proposed to raise the breakwater above high-water mark, so as to offer better protection for vessels anchoring in Gosport Harbor.

Star Island lies westward of Cedar Island, a channel with 6 feet at low water separating them. On the northern side of the island are several hotels and a steamboat landing for the steamer plying to Portsmouth, N. H.

Lunging Island is a low, bare, rocky islet, surrounded by ledges and lying ½ mile westward of Star Island. The channel between these islands is obstructed by rocks which are marked by a buoy.

White Island is the southernmost of the group and is marked by Isles of Shoals Lighthouse; ledges extend ¼ mile southwestward and westward from the island.

Anderson Ledge, showing partly bare at low water and marked by a spindle, lies 1 mile **SE.** by **E.** ¼ **E.** from Isles of Shoals Lighthouse, and is the farthest outlying danger. The ledge is about 200 yards in diameter and has good water all around it.

Cedar Island Ledge shows bare at low water and lies about ⅝ mile **SE.** ½ **E.** from Cedar Island; it is about 300 yards long **E.** and **W.** and is surrounded by deep water.

REMARKS ON APPROACHING AND PASSING ISLES OF SHOALS.

The islands can be seen a distance of 10 miles on a clear day, the hotels being most prominent, and vessels passing westward can avoid all danger by giving them a berth of ¼ mile. Passing eastward care should be taken to avoid Cedar Island and Anderson ledges; giving the islands a berth of 1¼ miles leads well clear. Isles of Shoals Lighthouse covers the entire horizon, but the hotels on the islands northward shut the light out occasionally when approaching the islands from that direction. A stranger desiring to land on the islands should be guided by chart 330.

COAST FROM PORTSMOUTH HARBOR ENTRANCE, N. H., TO CAPE ANN, MASS.†

From Portsmouth Harbor entrance to Hampton Harbor, a distance of about 10 miles, the coast has a general **SW.** ½ **S.** trend, with no very marked indentations: it presents the appearance of a succession of sand beaches separated by ledges jutting out into the sea, with occasional hotels and summer houses back of the high-water line. **Rye Beach**, a summer resort, and **Rye Village** are about 5 miles from Portsmouth Harbor entrance. **Rye Harbor** is a small cove, almost entirely bare at low water, about 4 miles southwestward of Whaleback Lighthouse. About ⅝ mile southward of the cove is a life-saving station, where **storm warning displays** of the United States Weather Bureau are made. Lying about 5 miles offshore, between Portsmouth Harbor entrance and Rye Harbor, are the Isles of Shoals. **Hampton Beach** extends from Rye Beach to Great Boars

* Shown on charts **108**, scale $\frac{1}{80,000}$, price $0.50; **330**, scale $\frac{1}{20,000}$, price $0.20. † Shown on chart **108**, scale $\frac{1}{80,000}$, price $0.50.

Head, a distance of 2½ miles; back of the beach is the village of **Hampton.** **Great Boars Head** is a point making out ¼ mile at the southern end of Hampton Beach and about 1½ miles northward from Hampton Harbor entrance; it is about 40 feet high, and the eastern face presents a precipitous appearance; there are several hotels and a number of summer cottages on the head. **Hampton Harbor,** or **Hampton River,** is a shallow stream, only used by small local craft. Several dangerous ledges lie off its entrance, and 2¾ miles **SE. ¾ S.** from Great Boars Head is **Hampton Shoal Ledge,** which has a least depth of 19 feet over it.

From Hampton Harbor the shore extends about 4½ miles in a **S.** by **W.** ¼ **W.** direction to the entrance of Merrimac River (Newburyport Harbor), and is known as **Salisbury Beach.** Newburyport Lighthouse, on the southern side of the entrance, inside the jetties, is the guide for entering the Merrimac River (see heading "Merrimac River and Newburyport Harbor"). There is a live-saving station on the beach just south of the entrance.

From Merrimac River entrance the shore trends **S.** ¼ **E.** about 7½ miles to the entrance to Plum Island Sound and Ipswich River, and is known as **Plum Island Beach.** There are no outlying dangers along this beach, and a depth of over 5 fathoms will be carried 1 mile from the shore. Ipswich Lighthouse, on the southern side of the entrance to Ipswich River, is a prominent landmark (see heading "Plum Island Sound and Ipswich Harbor").

Ipswich Bay is the bight between the northern point of Cape Ann and Plum Island Beach; between these points it is about 6 miles wide and makes in southward about 3 miles. The bay is the approach to Ipswich, Essex, and Squam rivers, and has a depth of 4 to 15 fathoms except in its southern and southwestern sides, where the shore should be given a berth of a little over 1 mile to avoid the shoals off the river entrances.

From the entrance to Ipswich Harbor the shore extends 2 miles in a general southeasterly direction to the entrance of Essex River (see heading "Essex River"), and from thence about 2 miles to Annisquam Harbor (Squam River). Annisquam Harbor Lighthouse is on the eastern side of the entrance to the harbor.

Between Annisquam Harbor Lighthouse and Halibut Point, the northern point of Cape Ann, the shore has a general **NE.** by **E.** trend and presents a bold, rocky appearance, indented by several small coves. The villages of **Bay View** and **Lanesville** are situated on this stretch of the coast. Eastward of Halibut Point and westward of Straitsmouth Lighthouse is Sandy Bay, a large, deep, open bight which is to be made a harbor of refuge. Under the supervision of the United States Engineers a breakwater is being constructed in a northwesterly and westerly direction across the northern side of the bay (see heading "Sandy Bay and Rockport Harbor").

Cape Ann Lighthouses, on Thatcher Island, bear **S. ¾ E.,** distant a little over 1½ miles from Straitsmouth Lighthouse. Two small, unimportant coves make into the eastern shore of Cape Ann between them. The passage between Thatcher Island and Cape Ann is about ½ mile wide, but is obstructed by shoals and only used by local craft of light draft.

MERRIMAC RIVER AND NEWBURYPORT HARBOR.*

Merrimac River is the largest and most important river in the eastern part of Massachusetts; it is the approach by water to the cities of Newburyport and Haverhill, and the towns of Salisbury and Bradford, and is navigable for vessels of 10 to 11 feet draft at high water up to Haverhill, and 15 feet draft at high water to Newburyport. The river is seldom entered for refuge, but the towns on its banks have some trade, mostly coastwise. The entrance (Newburyport Harbor) is obstructed by a shifting bar, with 9 to 12 feet over it (according to the condition of the bar), which is dangerous to cross in heavy weather; it is marked by a lighthouse on its southern side and two range lights on posts on its northern side, and bears **NW.** by **N.,** distant about 11 miles, from Halibut Point, the northern point of Cape Ann, and **SSW. ¾ W.,** distant 15 miles from Whaleback Lighthouse, at the entrance to Portsmouth Harbor. Under the supervision of the United States Engineers, breakwaters, with an opening 1,000 feet wide between the ends, have been built from both points at the entrance out to the bar. The channel between the entrance and the head of tide water, about 1½ miles above Haverhill, is narrow and crooked in places; it has been improved by the removal of some rocks and by dredging. Several drawbridges cross the river between the lower end of Newburyport and Haverhill; the width of the draws is about 40 feet.

Newburyport is a city on the south bank of the river, about 2½ miles above the entrance; it has considerable coastwise and some foreign trade. The deepest draft that can cross the bar at high water under favorable conditions is 15 feet. The usual draft is 11 feet; there is 11 feet at low water alongside some of the wharves. The city is on the line of the Eastern Division of the Boston and Maine Railroad.

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*Shown on chart **108**, scale $\frac{1}{80,000}$, price $0.50

Haverhill is a manufacturing city on the south bank of the river, about 15½ miles above its mouth. Vessels bound to Haverhill usually tow up the river at high water. The mean rise and fall of tides at the city is about 4½ feet.

Prominent objects.—Newburyport Lighthouse (see table, page 22) is on the southern point at the entrance inside of the breakwaters. On the northern side opposite the lighthouse are **two range lights** on posts, which form the range for crossing the bar; this range does not, however, always lead in the best water across the bar. About 1 mile northward, on Salisbury Beach, is a large hotel.

The best and usual **anchorage** in the river is in the channel just above Black Rock beacon in 15 to 16 feet water.

Pilots.—Strangers entering the river should take a pilot, and it is advisable for all vessels over 9 feet draft to take one, as the channel over the bar changes after heavy easterly gales. Vessels bound up the river above Newburyport should take a pilot or towboat. Pilots can be had by making signal outside the bar, standing off and on outside the whistling buoy until boarded. Pilotage is compulsory for all vessels except steam vessels regulated by the laws of the United States and carrying a pilot commissioned by United States Commissioners, vessels regularly employed in the coasting trade, fishing vessels other than whalers, and vessels of less than 7 feet draft of water.

The rates for outward pilotage are: From 7 to 12 feet draft, 65 cents per foot; from 12 to 15 feet, inclusive, 85 cents per foot; upward of 15 feet, $1.05 per foot.

The rates for summer inward pilotage are: From 7 to under 12 feet draft, 95 cents per foot; from 12 to 15 feet, inclusive, $1.25 per foot; over 15 feet, $1.60 per foot.

The rates for winter inward pilotage are: From 7 to 12 feet draft, $1.25 per foot; from 12 to 15 feet, inclusive, $1.65 per foot; over 15 feet, $2.10 per foot.

Vessels not spoken until within the bar shall pay only half pilotage; if not spoken until within the Black Rocks shall pay no compulsory pilotage.

Towboats can be had at Newburyport; sailing vessels bound up the river usually take one.

Supplies.—Coal in large quantities can be obtained in Newburyport alongside the wharf or in lighters. The water in the river is fresh for about 7 months in the year. Provisions and some ship-chandler's stores can be had at Newburyport.

Harbor regulations.—The harbor master has control of the anchorage and the berthing of vessels at Newburyport.

Quarantine regulations.—The board of health may from time to time establish the quarantine to be performed by vessels arriving within the harbor. The **Quarantine anchorage** is at Black Rock, above which no vessel with contagious or infectious disease on board is allowed to pass without permission from the board of health.

Storm warning displays of the United States Weather Bureau are made at Newburyport, and can be seen by the shipping in the harbor.

Freshets occur sometimes in the spring, but as a rule they do not interfere with navigation.

Ice seldom obstructs navigation as far up as Newburyport; drift ice may sometimes interfere with vessels under sail, but steamers and vessels assisted by towboats can usually work their way through. Westerly winds carry the drift ice out to sea; during their continuance the flood current has no effect upon the local formations or drift ice. With the wind from any other direction the flood current will prevent the drift ice from leaving the river.

For **tides** see table; page 27.

SAILING DIRECTIONS, NEWBURYPORT HARBOR.

These directions lead up to the whistling buoy off the bar. Strangers wishing to enter the river should take a pilot. The bar can not be crossed in easterly gales, and vessels should either make Gloucester or Portsmouth harbors for an anchorage until the sea will allow them to cross the bar.

1. ***Approaching from Northward.***—When southward of Isles of Shoals bring the lighthouse to bear *NE.* ½ *E.* and steer **SW.** ½ **W.**, and keep about 1 mile offshore when Newburyport Lighthouse is approached. When Newburyport Lighthouse bears about *NW.* by *W.* ⅛ *W.* the whistling buoy off the entrance should be on a line with it. Keep outside the whistling buoy until boarded by a pilot.

1 A. ***Approaching from Southward.***—Pass 1 mile or more eastward of Cape Ann Lighthouses and steer **N.** by **E.** Leave the beacon on the Dry Salvages about ⅝ mile on the port hand, and when it is in range with Straitsmouth Lighthouse bearing *WSW.*, steer **NW.** ½ **N.** When approaching Merrimac River entrance keep about 1 mile offshore and outside the whistling buoy until boarded by a pilot.

Remarks.—The sailing directions in the two preceding sections lead well clear of all dangers. It should be remembered that only light-draft vessels can cross the bar at high water when there is more than an ordinary sea from eastward.

PLUM ISLAND SOUND AND IPSWICH RIVER*

have a common entrance 7½ miles **S.** from Newburyport entrance and 5 miles **W.** by **N.** from Halibut Point, the northern point of Cape Ann. The entrance is marked by a lighthouse and range light on its southern side, but a shifting bar, with 5½ feet in the channel at low water, makes the services of a pilot necessary. In strong northeasterly winds the harbor is practically closed to all but small craft on account of the sea which breaks across the bar. Inside the entrance and in the channel of Plum Island Sound good anchorage can be found in 3 to 5 fathoms water.

The town of **Ipswich,** on the Ipswich River, about 3 miles above the lighthouse, can be reached through a narrow dredged channel which has about 3 feet at low water in several places below the town. The mean rise and fall of tides at the entrance is 8.8 feet.

Strangers desiring to enter should lie off with pilot signal set, keeping 1¼ miles from the shore until boarded by a pilot.

ESSEX RIVER.*

This is an unimportant stream flowing in a general northeast direction and emptying into the bight westward of the peninsula of Cape Ann. The entrance between Two Penny Loaf on the east and Castle Neck on the west is about midway between Ipswich and Annisquam Harbor lighthouses; it has a shifting bar over which a depth of about 5 feet can be taken through a narrow buoyed channel. The river is navigable at high water for vessels of 7½ feet draft as far as the town of **Essex,** a distance of 4 miles above its mouth, but vessels of 13 feet draft have been taken over the bar to an anchorage inside the entrance. Light-draft vessels sometimes enter the river for shelter from northeasterly winds, coming to anchor under the lee of Two Penny Loaf, but strangers should always take a pilot, keeping Annisquam Harbor Lighthouse bearing southward of **SE.** by **S.** until boarded by one. Sailing vessels bound to Essex usually take a towboat on account of the narrow, crooked channel; towboats may be had from Gloucester. There are two shipyards at Essex where wooden vessels are built and repaired.

Sailing directions for entering the river would be apt to mislead on account of the shifting nature of the bar.

ANNISQUAM HARBOR AND SQUAM RIVER.*

This is the easternmost harbor in Ipswich Bay; it is of little importance, being only used by a few small vessels as a harbor of refuge and by coasters carrying coal to the village of **Annisquam,** which is on the east shore just inside the mouth of the river. Squam River flows in a northerly direction and has a narrow channel which is navigable for vessels of 8 feet draft at high water, up to the railroad bridge 3¼ miles above its mouth. The deepest draft taken to Annisquam is 12 feet and the usual draft entering about 8 feet; there is 5 feet of water alongside the wharf at the village.

The entrance of the river is obstructed by a bar, over which a buoyed channel, with a depth of about 6 feet at low water, leads into the river. **Annisquam Harbor Lighthouse** (see table, page 22) is on the eastern point at the entrance and the principal guide for entering. On the beach southeastward of the lighthouse is a life-saving station of the Massachusetts Humane Society. The usual anchorage is in the channel inside of Lobster Rock beacon, but it is exposed to north and northwesterly winds. Strangers entering Annisquam Harbor usually take a pilot, standing off and on outside with signal set until boarded by one. There are no regular pilots. If a towboat is desired one may be obtained from Gloucester.

Tides.—The mean rise and fall of tides is 8.8 feet. See also tide table on page 27.

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*See footnote on page 196.

GENERAL DIRECTIONS, ANNISQUAM HARBOR.

These directions are good only for small craft; vessels of over 4½ feet draft should await a favorable tide.

Bring Annisquam Harbor Lighthouse to bear **S.** when it is about ¾ mile distant and steer for it on this bearing, passing about midway between the two spar buoys which are just outside the bar. When the lighthouse is about 350 yards distant ahead change course to **SSW.**, leave the lighthouse about 150 yards on the port hand and *Lobster Rock* beacon (square openwork granite) about 75 yards on the port hand. Leave *Babsons Point*, the point seen on the port bow, about 150 yards on the port hand, and when it bears abeam change course to **SSE. ½ E.** Take care not to be set on to the *Barn Rocks* which lie 225 yards *W.* by *N.* from Babsons Point. Anchor in the channel with the western end of Babsons Point bearing *N.*

SANDY BAY AND ROCKPORT HARBOR.*

Sandy Bay is the large bight in the northeastern shore of Cape Ann, between Straitsmouth Island on the east and Andrews Point on the west. Between these points the bay is 2 miles wide and about 1½ miles long to its head (Rockport Harbor). Under the supervision of the United States Engineers improvements are in progress to make this bay a harbor of refuge. A breakwater is being built which is to extend 1,200 yards from Avery Ledge in a **N. ¼ W.** direction to Abners Ledge, with its axis on the range of Avery Ledge and Cape Ann South Lighthouse. In 1902 the substructure of this breakwater had been finished to mean low water. The breakwater, which is to extend 1,800 yards in a **NW.** by **W.** direction from Abners Ledge toward Andrews Point, was level with mean high water for a distance of 400 feet from Abners Ledge, and for an additional distance of 700 yards the substructure had been built so that it had 22 to 25 feet of water over it at mean low water. When completed the breakwater will protect an anchorage of 1,377 acres, with depths ranging from 5¼ to 14¼ fathoms. The uncompleted part of the breakwater is generally marked by stakes and buoys.

The channel between Straitsmouth Island and Avery Ledge has a width of about 250 yards, with a depth greater than 4 fathoms, and a depth of 4¼ fathoms is found in the middle of this channel. From northward the bay is entered westward of the northern arm of the breakwater, and the depth is 10 to 13 fathoms.

Pigeon Cove bears **NW. ¼ W.** from Straitsmouth Lighthouse. It affords shelter for a limited number of vessels of not more than 10 feet draft behind a breakwater which extends out from its northern side. A small charge is made to vessels using this as a harbor of refuge. Strangers should take a pilot at the entrance to the cove.

The **Rockport Granite Company's Harbor** bears about **WNW.** from Straitsmouth Lighthouse; it is protected by a breakwater and affords shelter for a limited number of vessels of less than 12 feet draft. Strangers should take a pilot at the entrance.

Rockport Harbor is at the head of Sandy Bay and comprises the open bight at the head of the bay known as the **Outer Harbor**, and a small cove with a narrow entrance, just eastward, called the **Inner Harbor.** The Outer Harbor is open to northerly and easterly winds, and is sheltered only against southerly and westerly winds. The Inner Harbor is much used as a harbor of refuge, but it is small and can only accommodate a limited number of small craft. The entrance is about 70 yards wide at low water, and inside the harbor is about 300 yards long and 100 yards wide. At the head is the basin, about 100 yards wide and 130 yards long, which is inclosed by stone piers and is almost all bare at low water. It is proposed to repair the breakwater of the Inner Harbor.

The town of **Rockport** is situated along the shore of Rockport Harbor; it is about 3 miles from the town of Gloucester, and of no commercial importance.

Tides.—The mean rise and fall of tides is 8.6 feet (see also table, page 27).

SAILING DIRECTIONS, SANDY BAY.

The directions in section 1 are good for a least depth of 8 fathoms to the anchorage in the Outer Harbor at Rockport. The directions in section 1 A are good for a least depth of 4½ fathoms. No stranger should attempt to enter the Inner Harbor without a pilot.

*Shown on charts **108, 109,** scale $\frac{1}{80,000}$, price of each $0.50; **333,** scale $\frac{1}{20,000}$, price $0.20.

1. ***Approaching and Entering, from Northward.***—When Straitsmouth Lighthouse is made steer for it on any bearing eastward of **S.**, and as Andrews Point is approached shape the course so as to pass ¼ mile eastward of it. Pass ¼ mile eastward of Andrews Point and steer **S.** until Straitsmouth Lighthouse bears *SE.* by *E.* ¾ *E.* Then anchor in 9 to 10 fathoms; the entrance to the Inner Harbor will then bear about **SW.**, and be distant a little over ¼ mile.

Remarks.—When steering for Straitsmouth Lighthouse, Halibut and Andrews points should be on the starboard bow, and be left ¼ mile distant on the starboard hand when passing. The town of Rockport will be seen on the starboard bow at the head of Sandy Bay. At low water parts of the east breakwater will be seen extending from about ⅜ mile **NNE.** from Straitsmouth Lighthouse, and the Dry Salvages will be seen about ⅞ mile farther eastward. The submerged breakwater is generally marked by a number of range poles and wooden mooring buoys. The breakwater of the Inner Harbor has been beaten down by the sea, and is partly covered at high water.

Dangers.—Ledges extend nearly 200 yards northward and eastward from Halibut and Andrews points; they show partly bare at low water. To avoid them give the points a berth of ¼ mile or more.

Flat Ground is a dangerous, rocky shoal, with 2 to 14 feet water on it, nearly ½ mile long in a **NNE.** and **SSW.** direction, and a little over ⅛ mile wide at the widest part. Its southern end bears **NNE.** ¼ **E.** distant ⅞ mile from Straitsmouth Lighthouse, and is marked by a buoy (spar, red, No. 2).

Avery Ledge is a cluster of sunken rocks, with a least depth of 4 feet over them, lying nearly ⅜ mile **NNE.** ¼ **E.** from Straitsmouth Lighthouse. It is marked on its southwestern side by a red bell buoy. The south end of the east breakwater is on this ledge.

Dodges, Mitchells, and **Bartletts rocks** lie in a cluster nearly ¼ mile from the western shore of Sandy Bay, about **NW.** by **W.** ½ **W.** from Straitsmouth Lighthouse and northeastward of the entrance to the Rockport Granite Company's Harbor. Some of these rocks are nearly bare at low water, and Dodges Rock is marked by a spindle (iron shaft, red, cage on top). Mitchells Rock, 4¼ feet water, lies about 230 yards **N.** by **E.** ¼ **E.** from the spindle. There are two spots with 12½ feet and 14 feet of water, respectively, about 275 yards **S.** by **E.** ½ **E.** from the spindle.

Twelve-foot Rock is comparatively small and lies 350 yards from the south shore of Sandy Bay and nearly ⅝ mile **WNW.** ¼ **W.** from Straitsmouth Lighthouse. It is marked by a buoy (spar, black, No. 3), and is left on the port hand by vessels bound into Rockport Harbor.

Harbor Rock, awash at low water of spring tides, lies about 100 yards northeastward of the end of the breakwater at the western side of the entrance to the Inner Harbor, and is marked by a red spar buoy.

1 A. ***Approaching and Entering, from Southeastward.***—Keep at least ¾ mile eastward of Cape Ann Lighthouses, and steer for Straitsmouth Lighthouse on any bearing between **W.** ½ **S.** and **NW.** by **N.** Leave the lighthouse ¼ mile on the port hand and pass about 200 yards south of the red bell buoy on Avery Ledge, steering **W.** by **N.**; in passing between the bell buoy and lighthouse, the latter will be left 400 yards on the port hand. Continue the **W.** by **N.** course until the tall dark chimney in Rockport bears *SW.* by *S.*, and then anchor as directed in section 1, preceding.

Remarks.—Thatcher Island should be left ¾ mile on the port hand to avoid the Londoner. When approaching Straitsmouth Lighthouse, the beacon on the Dry Salvages will be seen northeastward of the lighthouse; westward of the beacon are the Little Salvages, over which the sea breaks when they are not showing bare. The sailing line leads south of Avery Ledge; parts of the breakwater show at low water.

On the **W.** by **N.** course the entrance to the Rockport Granite Company's Harbor will be ahead and the town of Rockport and the entrance to the Inner Harbor will be on the port bow. As the tall brick chimney in Rockport approaches a **WSW.** bearing, the buoy marking **Twelve-foot Rock** should be over 100 yards on the port beam.

Dangers.—**The Londoner** is a ledge about ⅜ mile long in a **NE.** and **SW.** direction and a little over ⅛ mile wide; it has a general depth of 7 to 15 feet over it and lies ½ mile **ESE.** from Cape Ann Lighthouses. Near the southern part of the ledge, on a cluster of rocks which show bare at low water, is a spindle (iron shaft, with cage on top). There is a passage with 5¾ fathoms between The Londoner and Thatcher Island, which should not be attempted by a stranger.

Dry Salvages is nearly 500 yards long in a **N.** and **S.** direction, and shows partly bare at low water; near its middle is a small, bare rock with a red tripod beacon 55 feet high, which is a little over 1 mile **ENE.** ⅛ **E.** from Straitsmouth Lighthouse.

Little Salvages is a ledge showing bare at low water; it lies about ¼ mile westward of Dry Salvages. Shoal water extends out a little more than 200 yards from the western side of the bare part of the ledge, and a rock, bare at lowest tides, lies between it and Dry Salvages.

The **Flat Ground** and **Avery Ledge** are described under section 1, preceding.

Ledges extend northeastward and eastward from Straitsmouth Lighthouse a distance of 300 yards, and vessels passing the lighthouse should give it a berth of 400 yards while eastward and northeastward of it.

For the dangers in Sandy Bay see "Dangers" under section 1, preceding.

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APPENDIX I.

TIDAL CURRENTS, GULF OF MAINE.

TIDAL CURRENTS AT ENTRANCE TO GULF OF MAINE.*

Observations show that the tidal currents of this locality are of sufficient strength to render their consideration in the reckoning, especially of sailing vessels, highly important. A chart of the Gulf of Maine, showing the positions of the stations at which the observations were made, and the locality of the "tide rips," will be found facing this page.

The simplest statement that can be made respecting these currents is the following:

GENERAL RULE.

Along the whole line between Nantucket Shoals and Cape Sable Bank the ebb current runs southwardly during the first four and a half hours after the *southing* or *northing* of the moon; and the flood current northwardly from the sixth to the eleventh hour after the the *southing* or *northing* of the moon. The time of turning on Georges Bank corresponds nearly with the time of high or low water at Boston and Portland; but in the channel westward of the bank it is later, and eastward earlier.

Of the two following tables, No. 1 gives the direction and rates of the tidal currents for four divisions of the belt examined between Nantucket Shoals and Cape Sable Bank; but the times given in it are subject to variations of twenty-two minutes each way, and the rates of the currents to variations up to one-fifth by reason of the tidal inequalities. If, however, the navigator has the "*Tide Tables for the Atlantic Coast,*" issued from the Coast Survey Office (and in which high water for Boston is given for every civil day of the year), Table No. 2 will be found more convenient and accurate for practical use, since no corrections of time for tidal inequalities are required. In this table (No. 2) the hours at the heads of the columns are tidal hours, or twelfths of the time between any two following high waters—one high water being assumed to occur at 0^h and the next at XII^h. The rates given are those for an ordinary tide of 9.8 feet range at Boston, and must be increased or diminished proportionally with the range of the tide.

All of the directions are *magnetic.*

TABLE I.

Locality of Station.	Time of Turning After Moon's Transit.		First Quarter.		Strength.				Third Quarter.		Remarks.
	Flood to ebb.	Ebb to flood.	Set.	Drift.	Times after moon's transit.		Set.	Drift.	Set.	Drift.	
	h. m.	*h. m.*		*Miles.*	*h. m.*	*h. m.*		*Miles.*		*Miles.*	
Great South Channel (between Nantucket Shoals and Georges Bank).	11 55	--------	S. ½ W	0.9	2 37	--------	S. by W. ¾ W	1.3	WSW	0.94	Ebb.
	--------	5 37	N. ½ W	1.0	--------	8 43	N. ½ W	1.4	N. by W	0.85	Flood.
Georges Shoal	11 19	--------	SE	1.6	2 1	--------	S. ½ E	1.9	SSW	1.40	Ebb.
	--------	5 7	NW. ½ W	1.6	--------	8 13	N. by W	1.9	NE	1.40	Flood.
Great Eastern Channel (between Georges Bank and Brown Bank).	11 14	--------	SE	1.0	1 56	--------	S. ½ E	1.4	SSW	1.20	Ebb.
	--------	5 2	NW. ½ W	1.1	--------	8 8	NNW	1.3	N. ½ E	1.00	Flood.
Northern Channel (between Brown Bank and Cape Sable Bank).	10 50	--------	SE	1.3	1 32	--------	SE. ¾ S	1.3	S. by E	1.00	Ebb.
	--------	4 38	W. by N	1.0	--------	7 44	NW. by W	1.4	WNW	1.00	Flood.

*The rule and tables I and II, given for the use of navigators, have been deduced by Prof. Henry Mitchell, Assistant, Coast and Geodetic Survey, from observations made by the Coast Survey during the summer of 1877, at eight stations between Nantucket Shoals and Cape Sable, with the schooner *Drift*, Acting Master Robert Platt, U. S. N., Assistant, Coast and Geodetic Survey, commanding.

TABLE II.

RATE AND DIRECTION OF CURRENT FOR EACH TIDAL HOUR AFTER TIME OF HIGH WATER AT BOSTON.

Locality.	0^h		1^h		2^h		3^h	
	Rate, Miles.	Direction.	Rate, Miles.	Direction.	Rate, Miles.	Direction.	Rate, Miles.	Direction.
Great South Channel	0.3	NE. by N.	0.6	SE. by E. ½ E.	1.0	S. ½ W.	1.3	S. by W. ½ W.
Georges Shoal	0.8	E.	1.5	SE.	1.8	SSE.	1.9	S. by W.
Great Eastern Channel	0.6	E. by S.	0.9	SE.	1.3	SSE.	1.4	S. ½ E.
Northern Channel	0.7	E. by N.	1.2	SE.	1.3	SE. ½ S.	1.2	SSE. ½ E.
	4^h		5^h		6^h		7^h	
Great South Channel	1.2	S. by W. ½ W.	0.9	S. by W. ½ W.	0.3	SW. ½ S.	0.5	NW. by W.
Georges Shoal	1.6	SW.	1.2	SW.	0.8	W. by S.	1.4	NW. by W.
Great Eastern Channel	1.3	SW.	1.0	SW.	0.3	WSW.	1.0	NW. by W.
Northern Channel	1.0	S. by E.	0.6	S.	0.3	W. by S.	0.9	W. by N.
	8^h		9^h		10^h		11^h	
Great South Channel	1.0	N. ½ W.	1.3	N. ½ W.	1.3	N. ½ W.	0.9	N. ½ W.
Georges Shoal	1.7	NW. by N.	1.8	N. by E.	1.6	NNE.	1.2	NE. by E.
Great Eastern Channel	1.2	NW. ½ N.	1.3	NNW.	1.2	N. by E.	0.7	NE.
Northern Channel	1.3	NW. by W.	1.1	NW. by W.	0.9	NNW.	0.5	N. by E.

CURRENTS—CAPE ANN TO CAPE COD.*

CURRENTS ON STELLWAGEN BANK AND ITS VICINITY.

Over Stellwagen Bank, and in the channel between it and Cape Cod, the current of the ebb (easterly) begins to run for half an hour to one hour *before* the time of high water at Boston. Three hours *after* that high water the *strength* of the current of ebb is reached; and then (at that time) it runs ¾ mile an hour, about **E.** by **N.** About six hours *after* the time of high water at Boston the ebb slacks; and soon after the current turns in the opposite direction. Three hours later (between the ninth and tenth hours *after* the time of high water at Boston) the *strength* of the current of flood is reached, with a velocity of nearly ¾ mile in a **W.** by **N.** direction.

CURRENTS ON THE EASTERN COAST OF CAPE COD.

On the outside (eastern) coast of Cape Cod the tidal currents run generally parallel with the shore. Ebb and flood are of unequal velocity and duration, the former usually predominating.

The *strength* of the ebb current (running southward) is reached at the *southing of the moon;* that of the flood current (running northward) about six hours *later*.

Off Chatham lights *two miles* per hour, and off Cape Cod Light *one mile* may be expected at *strength*.

*The rules and table given under this heading are from the reports of Prof. Henry Mitchell, Assistant, Coast and Geodetic Survey, and are based on reductions by Mr. Henry L. Marindin, Assistant, Coast and Geodetic Survey, and himself, of the careful observations made by Master Robert Platt, U. S. N., and Lieut. J. E. Pillsbury, U. S. N.

TABLE III.

RATE AND DIRECTION OF CURRENT FOR EACH TIDAL HOUR AFTER TIME OF HIGH WATER AT BOSTON.

Locality.	0h		1h		2h		3h	
	Rate, miles.	Direction.	Rate, miles.	Direction.	Rate, miles.	Direction.	Rate, miles.	Direction.
In the Channel between Race Point and Stellwagen Bank	0.4	ENE.	0.7	E. ½ N.	0.8	E. by N.	0.8	E. by N.
On Stellwagen Bank	0.6	ENE.	0.7	ENE. ½ E.	0.7	ENE. ½ E.	0.8	E. by N.
Ten miles southward of Cape Ann	0.2	WNW.	0.3	NNW.	0.2	NNW.	0.2	NNE.
*Six miles southward of Cape Ann	0.3	SSE. ½ E.	0.3	SE. by E. ½ E.	0.4	SE. by E. ½ E.	0.3	SE. ½ E.

Locality.	4h		5h		6h		7h	
	Rate, miles.	Direction.	Rate, miles.	Direction.	Rate, miles.	Direction.	Rate, miles.	Direction.
In the Channel between Race Point and Stellwagen Bank	0.7	ENE. ½ E.	0.5	NNE. ½ E.	0.2	E. by N.	0.4	SW. by W. ½ W.
On Stellwagen Bank	0.7	E.	0.3	E. by S.	0.2	SE.	0.5	WSW.
Ten miles southward of Cape Ann	0.3	NNE.	0.4	NNE. ½ E.	0.2	NNE. ½ E.	0.2	ESE.
*Six miles southward of Cape Ann	0.2	SE. ½ E.	0.2	SE. by E.	0.2	SSW.	0.2	SW. by S.

Locality.	8h		9h		10h		11h	
	Rate, miles.	Direction.	Rate, miles.	Direction.	Rate, miles.	Direction.	Rate, miles.	Direction.
In the Channel between Race Point and Stellwagen Bank	0.5	SW. by W. ½ W.	0.7	W. ½ N.	0.6	W.	0.3	ESE.
On Stellwagen Bank	0.6	W. ½ S.	0.6	WNW. ½ W.	0.6	NW. by N.	0.6	N. ½ E.
Ten miles southward of Cape Ann	0.4	WSW.	0.5	WSW.	0.6	W.	0.4	WNW.
*Six miles southward of Cape Ann	0.2	SW. ½ W.	0.2	W. by S.	0.2	SW. by W.	0.2	S. ½ W.

* The observations at this station are doubtful, owing to the prevalence of heavy gales at the time they were made.

APPENDIX II.

PILOTS AND PILOTAGE, HARBOR CONTROL, QUARANTINE, ETC.

MAINE.

Extracts from the Revised Statutes of Maine, 1887.

TITLE III. CHAPTER 36.

PILOTS.

Sec. 1. The governor, with the advice and consent of council, may appoint pilots for any port, * * *; and such pilots shall, before entering upon said duties, be sworn, and give bond to the treasurer of State in the sum of five thousand dollars for the faithful performance thereof.

Appointment, oath, and bond of pilots.

Sec. 2. Such pilots shall take charge of all vessels, drawing nine feet of water and upwards, bound into, and of all such vessels, except coasting and fishing vessels, bound to sea out of said ports, and shall pilot them into or out of the port assigned them, first showing the master thereof their branch and informing him of their fees; but any master may pilot his own vessel without being subject to pay therefor.

Their duty.

Master may pilot his own vessel.

Sec. 4. If any vessel while under the charge of such pilot, is lost, run aground, or cast away, through his fault, he is liable to pay the owner or insurer a just compensation for any damages thereby sustained.

Liability for damage caused by their fault.

TITLE III. CHAPTER 36.

PORT WARDENS.

Sec. 23. Port wardens shall be elected in any city or town situated on navigable waters, upon the petition of ten or more citizens engaged in commercial pursuits therein.

Port wardens, election of.

Sec. 28. When requested by any person interested, port wardens shall proceed on board of any vessel on her arrival in port and survey her hatches * * *. They shall also examine the condition and stowage of the cargo of any vessel, * * * they shall examine goods, wares, or merchandise of any description, in any warehouse or store, or on any wharf or at any place where the same are; provided, that said goods, wares, or merchandise are part of the cargo, and are claimed to be damaged; * * *.

Duty of port wardens on arrival of vessels.

Sec. 29. When requested in writing by any person interested, port wardens shall also survey the cargo of vessels arriving in port in distress; * * *.

Duty of port warden in case of vessels arriving in distress.

Sec. 30. When requested in writing by any person interested, they shall also survey any vessel which may have suffered wreck or damage, or which may be deemed unseaworthy; * * *.

In case of wrecked or damaged vessels.

TITLE I. CHAPTER 3.

HARBOR MASTERS.

Sec. 64. Selectmen of towns may annually appoint a harbor master, who shall be subject to all the duties and liabilities of said officer in cities, * * *. Where two or more towns or cities, or a town and city, are situated on the same general harbor, the larger town or city has the appointing power as above.

Selectmen may appoint harbor masters.

Where one harbor includes two or more towns.

Extracts from the Acts and Resolves of the Seventieth Legislature of the State of Maine, 1901.

CHAPTER 259.

Sec. 2. Such rules and regulations as may be made by such municipal authorities shall be enforced and carried out by the harbor master of said town, who may appoint a deputy to act in case of his absence or disability.

Sec. 3. Such harbor master shall, upon complaint to him by the master, owner or agent of any vessel, cause any other vessel or vessels obstructing the free movement or safe anchorage of such vessel to remove to a position to be designated by him, and to cause, without any complaint being made to him, any vessels anchoring within the channel lines as established by the municipal authorities * * * to remove to such anchorage as he may designate.

Sec. 4. If such vessel has no crew on board, or if the master or other person in charge neglects or refuses to move such vessel as directed by the harbor master, then and in that case such harbor master may put a suitable crew on board and move such vessel to a suitable berth at a wharf or anchorage at the cost and risk of the owners thereof, and shall charge two dollars, to be paid by the master or owner of such vessel, which charge together with the cost of the crew for removing such vessel the harbor master may collect by suit.

Sec. 5. Harbor masters may, when assault is committed either upon themselves or any person acting under their authority, arrest and deliver to the police authorities on shore any person committing such assault.

Extracts from the Revised Statutes of Maine, 1887.

TITLE II. CHAPTER 14.

QUARANTINE.

Masters, seamen, or passengers of vessels may be examined on oath in reference to infectious distempers.

Sec. 17. If a master, seaman, or passenger of a vessel, in which there is, has lately been, or is suspected to have been, any infection, or which has come from a port where any infectious distemper prevails, dangerous to the public health, refuses to answer, on oath, such questions as are asked him relating to such infection or distemper, by the local board of health of the town to which such vessel comes, which oath either of said officers may administer, he shall forfeit not exceeding two hundred dollars or be imprisoned not more than six months.

Vessels with infected persons shall anchor at a distance from towns.

Sec. 18. When a vessel arrives at a port having on board any person infected with a malignant disease the master, commander, or pilot shall anchor it at some convenient place below the town of such port at a distance safe for the inhabitants thereof and the persons on board other vessels in said port; and no person or thing on board shall be brought on shore until the local board of health give their written permit.

Penalty for violation of this provision.

Sec. 19. For the willful violation of the preceding section such master or commander forfeits not exceeding two hundred and the pilot not exceeding fifty dollars for each offence.

Selectmen may establish quarantine regulations.

Sec. 20. The local board of health of a seaport town may cause vessels arriving there to perform quarantine at such place and under such regulations as they judge expedient, when they think that the safety of the inhabitants require it; and whoever neglects or refuses to obey such orders and regulations shall forfeit not exceeding five hundred dollars or be imprisoned not exceeding six months.

Selectmen to furnish signals.

Sec. 23. The local board of health of every seaport town requiring vessels to perform quarantine shall provide, at the expense of such town, a suitable number of red flags at least three yards in length; and the master of every vessel ordered to perform quarantine shall, during the term thereof, cause one of them to be continually kept at the head of the mainmast of his vessel; and no person shall board such vessel during said term unless by permission of said officers; if he does he shall be thereafter held liable to the same regulations and restrictions as those belonging to said vessel; and shall there be detained by force, if necessary, until discharged by said officers.

Restrictions on persons visiting vessels at quarantine.

Expenses, how paid.

Sec. 25. Expenses incurred on account of any person, vessel, or goods, under quarantine regulations, shall be paid by him, or the owner of the vessel, or goods, as the case may be.

REGULATIONS FOR THE PORT OF BANGOR.

Extract from a pamphlet edition (1902) of an Act Additional to an Act to Incorporate the City of Bangor.

Be it enacted by the Senate and House of Representatives in Legislature assembled.

Sec. 1. The city council of the City of Bangor are hereby authorized and empowered to make and ordain from time to time such by-laws not repugnant to the constitution and laws of the State, as they may deem necessary or expedient, for the location and regulation of vessels, boats, scows and rafts, in the harbor of said city, embracing the Penobscot River, from the north line of Hampden to the Bangor bridge, and the Kenduskeag Stream, from its mouth to the Kenduskeag bridge, and to affix penalties for the breach of such by-laws, not exceeding twenty dollars for any offence, to be recovered upon complaint by the harbor master, hereinafter named, before the police court of said city. Approved April 17, 1852.

City ordinance.

The harbor master shall, as soon as practicable after the arrival of any vessel or steamer in port, board her for the purpose of exhibiting to the master the regulations of the port, and directing the vessel where to lay, if necessary.

The harbor master shall be entitled to demand and receive a reasonable compensation for any service performed by him, at the request of any person, in carrying into effect any of the provisions of this ordinance; such compensation shall be paid to said harbor master in advance by the person requesting such service, and shall in no case exceed one dollar.

No vessel, steamboat or raft shall be allowed to anchor or lay in the main channel of the river, between the Bangor bridge and the north line of Hampden, so as to obstruct the free passage of vessels, boats or rafts up and down the river.

No vessel, boat or raft shall be allowed to anchor or lay between the mouth of Kenduskeag Stream and the Kenduskeag bridge, in such a manner as to obstruct the free passage of vessels, boats or rafts up and down said stream.

No vessel, boat or raft shall anchor or lay in the usual track of the ferry boats between Bangor and Brewer, nor in such manner as to obstruct the free passage of steamboats by their usual track, to and from their usual wharves.

If any owner or owners, or master of any vessel, or any other person, shall cast or throw, or cause or suffer to be cast or thrown from their vessels or from any other place, any stone, sand, or any other ballast, or any other thing, in the channel of said river or stream, whereby the navigation of the same may be injured, he or they shall forfeit and pay for each offence, a sum not less than five nor more than twenty dollars.

If any person or persons shall cast or throw, or cause or suffer to be cast or thrown, from any wharf or dock in said port of Bangor, into the water of said river or stream, any stone, sand, cinders, or anything which may decrease the depth of water at said wharf, or dock, he or they shall forfeit and pay for each offence a sum not less than five nor more than twenty dollars.

Vessels shall not lie more than one tier deep from City Point to the Bangor bridge.

All vessels coming to wharves shall have their anchors hanging at their catheads or hawse pipes.

The harbor master is hereby authorized, and it shall be his duty to remove, or cause to be removed any vessel or boat from any wharf in said port, at the request or direction of the owner of said wharf; and if any vessel, boat, or raft shall anchor or lie contrary to any of the regulations in any of the preceding sections, said harbor master shall forthwith give notice to the owner or master thereof, or the persons having care of the same, to remove the same, and if said notice be not complied with without delay, the harbor master shall make or cause said removal at the expense of the vessel, boat or raft.

The master, owner, or owners, of any vessel, boat or raft, or any other person who shall violate any of the provisions of this ordinance, shall for each offence forfeit and pay a sum not less than five dollars nor more than twenty dollars; and it shall be the duty of the harbor master, immediately upon the violation of any of said provisions, to cause the person or persons offending to be prosecuted for the penalty or penalties thereby incurred.

REGULATIONS FOR THE HARBOR AND PORT OF ROCKLAND, 1887.

An ordinance.

Be it ordained by the city council of Rockland, as follows:

Sec. 1. * * * The harbor master may board any vessel arriving in port for the purpose of exhibiting to the master thereof the ordinance and regulations of the port and direct the vessels where to lay, if he deem it necessary.

Sec. 2. If the owner, owners, or master of any vessel, or any other person, shall cast or throw, or cause to be thrown from their vessels or from any other place, any stone, sand, coal, lime, or other thing, at or near any of the wharves, whereby the depth of water is decreased, or the navigation to and from the same obstructed or injured, he or they shall forfeit and pay for each offence a sum not less than one or more than five dollars.

Sec. 3. A harbor master shall annually be elected by the city council. * * * Said harbor master is hereby authorized, and it shall be his duty, to remove, or cause to be removed, any vessel, boat, or raft from any wharf in said port of Rockland, at the request or direction of the owner of said wharf; and if any vessel, boat, or raft shall anchor or lie contrary to any of the regulations in any of the preceding sections, said harbor master shall forthwith give notice to the owner or master thereof, or the person having the care of same, to remove the same, and if said notice be not complied with, without delay, the harbor master shall make or cause said removal at the expense of the owner or owners of such vessel, boat, or raft.

Sec. 4. The master, owner, or owners of any vessel, boat, or raft, or any other person who shall violate any of the provisions of this ordinance, shall for each offence forfeit and pay a sum not less than one nor more than five dollars; and it shall be the duty of the harbor master immediately upon violation of any of said provisions to cause the person or persons offending to be prosecuted for such violations. The harbor master shall be entitled to demand and receive a reasonable compensation for any service performed by him at the request of any person, in carrying into effect any of the provisions of this ordinance; such compensation shall be paid in advance to said harbor master by the person requesting such service, and shall in no case exceed one dollar.

REGULATIONS FOR THE PORT OF BATH.

An act to authorize the city of Bath to appoint a harbor master for the port of Bath, and establish regulations for the anchoring of vessels in said port.

City may make ordinances for regulations of vessels in port.

Sec. 1. The city council of the city of Bath are hereby authorized to make such by-laws or ordinances as they may deem expedient, for the location and regulation of vessels in the port of Bath, and to impose penalties for breach of same, not exceeding ten dollars for one offense; * * *.

May appoint harbor master.

Sec. 2. The municipal authorities of the city of Bath may appoint a harbor master for the port of Bath, * * * whose duty it shall be to enforce the observance of the by-laws or ordinances aforesaid, and to exercise such powers as may be conferred upon him by the ordinances of the city.

(Approved February 6, 1877.)

CHAPTER XXV.

An ordinance relating to the harbor and harbor master.

Harbor master, his appointment, qualification, and tenure of office.

Sec. 1. There shall be appointed annually by the municipal authorities, * * * an able and discreet person, to be styled the harbor master, * * *.

Depositing ballast, etc., in harbor prohibited.

Penalty.

Sec. 3. No person shall throw or deposit, or cause to be thrown or deposited, in said harbor any ballast, stones, gravel, cinders, ashes, dirt, mud, or other substances which may in any way tend to injure the navigation thereof. Any person violating the provisions of this section shall for each offence forfeit and pay a sum not less than five nor more than ten dollars.

Regulations for vessels in harbor.

Sec. 4. The following rules and regulations are hereby adopted for the management of vessels in said harbor:

Free passage of ferryboats and steamboats not to be obstructed.

1st. No vessel, boat, or raft shall anchor or lie in the usual track of any ferryboat, or in such manner as to obstruct the free passage of steamboats by their usual track, to or from their respective landing places; nor shall any tugboat or other steamer leave any vessel, boat, or raft in such position as may obstruct any steamer as aforesaid.

Vessels not to lie at wharf so as to obstruct passage of other vessels.

2d. No vessel shall lie at any wharf or berth in such manner as to obstruct the free passage of other vessels coming in or going out, or being hauled from one wharf to another.

3d. All vessels at anchor in the harbor shall keep a clear and distinct light suspended at least six feet above the deck from sunset to sunrise.

Duty of harbor master to cause removal of vessels on request.

Manner of proceeding.

4th. It shall be the duty of the harbor master to cause the removal of any vessel, boat, or raft from any wharf in said harbor at the request of the owner of said wharf or his agent. The harbor master shall at once notify the master or owner or person in charge of any vessel, boat, or raft anchored or lying contrary to any of the rules or regulations of this chapter to remove

the same forthwith; and if such notice is not complied with said harbor master shall immediately cause said vessel, boat, or raft to be moved at the expense of the owner thereof. Upon neglect or refusal of the owner or master thereof to pay the expense of such removal, including two dollars and fifty cents for the harbor master's fee, on demand of the harbor master therefor, said owner or master shall be liable to a penalty for such neglect or refusal of not exceeding ten dollars in addition to such expense.

Removal at expense of owner.

Penalty for neglect to pay expense on demand.

Sec. 5. Any person violating, or the master or owner of any vessel, boat, or raft by which are violated, any of the provisions of this ordinance, shall for each offence forfeit and pay a sum of not less than five nor more than ten dollars; and it shall be the duty of the harbor master immediately upon such violation, to cause the person or persons liable, to be prosecuted for the penalties thereby incurred.

Penalty for violations of this ordnance.

ANCHORAGE LIMITS, PORT OF BATH.

TREASURY DEPARTMENT, *November 19, 1900.*

Pursuant to the Act of Congress approved June 6, 1900, the following-described anchorage grounds for vessels in the Kennebec River, at or near Bath, Me., are hereby defined and established, and the following rules and regulations governing the same are published for the guidance of the owner, master, or pilot of any vessel, or the person having charge of a steam vessel towing or otherwise conducting such vessel to an anchorage in the Kennebec River at or near Bath, Me.

Any violation of the rules and regulations herein promulgated will subject the owner, master, or person in charge of the vessel so offending to a penalty of $100.

L. J. GAGE,
Secretary.

Vessels may anchor within the following specified limits only:

1. To the northward of a line drawn from the north side of Passmore's wharf in Bath to a mark erected on the shore in Woolwich, 500 feet north of the Maine Central Railroad ferry slip.

2. To the southward of a line drawn from the derrick on the Bath Iron Works wharf to Sassanoa Point, in Woolwich.

3. One vessel may be anchored between the Maine Central Railroad ferry slip on the Bath side of the river and the line of the Maine Water Company's pipe; provided that such vessel's anchor be not less than 500 feet from the water pipe line, and that the vessel be so anchored as not to swing below the north side of the entrance to the ferry slip.

4. Vessels in the north anchorage must be so anchored as to leave a clear fairway 150 feet outside of the established harbor lines at Bath, and a clear fairway 200 feet from the east, or Woolwich shore, for the passage of steamers, tows, rafts, etc.

5. Nothing in these Rules and Regulations shall prevent the launching of any vessel into the waters between the anchorage limits thus defined for the protection of the ferries, water pipe and cable lines, or the bringing up of such vessels by their anchors; provided that the vessels so launched shall not endanger the water pipe and cable lines, and that they shall be removed therefrom within twelve hours from the time of anchoring.

6. Vessels passing through this part of the Kennebec River, within which anchoring is prohibited, must be "under command" of either sail or steam, or be in tow. Dropping with the current will not be permitted. Vessels not so under command will be subject to the same penalty as if anchored therein.

PORTLAND HARBOR.

Extracts from a pamphlet edition of the Rules and Regulations of the Harbor Master and the Ordinances, in force 1902.

ORDINANCE ON HARBOR.

Sec. 2. It shall be the duty of the harbor master to take charge and see to the preservation of the harbor, within the limits of the city of Portland, and extending to low water mark on the shore of Cape Elizabeth, and to enforce all such rules and regulations as may be ordained or ordered by the city council or mayor and aldermen from time to time, with reference thereto, and to collect all penalties that may be incurred by a violation of the same.

Sec. 3. No person shall throw or deposit, or cause to be thrown or deposited, in said harbor, any stones, gravel, cinders, ashes, dirt, mud, or other substance which may in any

respect tend to injure the navigation thereof. And any person violating the foregoing provisions of this section, shall for each offence be liable to a penalty of fifty dollars.

Sec. 4. If any of the rules and regulations thus established shall be violated, the master or owner of the vessel, by means of which said violation shall occur, shall for each offense be subject to a penalty of twenty dollars.

Sec. 5. If any vessel shall be anchored contrary to any of the rules and regulations provided for in the preceding section, the harbor master shall forthwith give notice to the master or owner thereof to remove said vessel at once; and if the same is not done without delay, or in case there is not a sufficient crew on board for that purpose, the harbor master shall cause such vessel to be removed at the expense of the owner or master thereof. And if the master or owner shall neglect or refuse to pay said expense on demand being made therefor by the harbor master, he shall be liable to a penalty of double the amount of such expense, in addition to the penalty provided in the preceding section.

ORDINANCE ON GUNPOWDER.

Sec. 6. No person shall haul unto or lay at any wharf, bridge, or other landing place in this city, or bring within two hundred yards thereof, any boat or vessel having on board any quantity of gunpowder exceeding twenty-five pounds, or land from or receive on board any boat or vessel, at any such wharf, bridge, or landing place, any gunpowder exceeding the amount aforesaid without obtaining a permit from the mayor; and no boat or vessel with gunpowder on board in quantity exceeding twenty-five pounds shall remain at any wharf, bridge or other landing place in the city more than six hours; nor shall any such boat or vessel be allowed to ground at any such place, or remain there after sunset.

Sec. 7. The mayor, or in his absence the chairman of the committee on fire department, may grant permits to land gunpowder for immediate shipment or transportation, on either of the abutments near the draw of Tukey's bridge; they may also grant permits to land or ship gunpowder from canal boats or other boats on board vessels lying at or near the end of Smith's wharf, or either of the wharves between said Smith's wharf and Portland bridge, provided that the consent in writing of the owner or agent, or wharfinger of such wharf shall first be delivered to the mayor.

Sec. 8. The mayor, or in his absence the chairman of the committee on fire department, may grant permits for landing upon or shipment from any wharf in the city, of gunpowder in quantity not exceeding six kegs of twenty-five pounds each.

Sec. 11. Every person violating any of these rules and regulations will be liable to a fine of not less than twenty, nor more than one hundred dollars, as provided in revised statutes, chapter twenty-six.

ORDINANCE ON HEALTH.

Sec. 6. * * * Nor shall any person or persons throw or cast any dead animal, or any foul or offensive matter in any dock or place between the channel and the shore, nor shall land any foul or offensive animal or vegetable substance within the city, nor shall cast any dead animal in the waters of the harbor or Back Cove.

Sec. 25. The harbor master and the city physician shall perform such duties relative to quarantining vessels as may be required by the mayor and aldermen, and shall receive therefor such fee and expenses from each vessel visited, liable to be quarantined, as may be fixed by the mayor and aldermen.

RULES AND REGULATIONS OF THE HARBOR MASTER.

I. All of Portland Harbor west of what is called "Hog Island Roads"* shall be denominated the upper harbor, and all vessels in said upper harbor shall be anchored according to the following rules under the direction of the harbor master:

II. All vessels entering the upper harbor, not intended to be conveyed to some wharf immediately shall be anchored on the southerly side of a line ranging with the black buoy off the breakwater, and a white buoy on a westerly course, thence on a line ranging with said white buoy and the southeasterly end of the draw of Portland bridge. No vessel to be anchored above the end of Union wharf.

III. Outward bound vessels shall be anchored on the northerly side of a line ranging from the easterly corner of the English steamer's coal wharf, so-called, and the southerly corner of Fort Gorges, said line being marked by white buoys.

IV. Vessels anchoring in "Hog Island Roads"* shall anchor on the easterly side of a line ranging with the southerly side of Fort Gorges and the "Bay View House" on Peaks Island, or on the southerly side of a line ranging with the observatory in Greenwood Garden, on Peaks Island, and the easterly end of House Island.

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*Diamond Island Roads.

V. Vessels may be anchored south of a line ranging with the black buoy off Spring Point Ledge, and the black buoy off the breakwater.

VI. No vessel shall be anchored in the channel of the harbor so as to obstruct the free passage of the regular lines of steamers running to and from this port, the island steamers, the ferryboats, or the entrances to the Marine Railway and Dry Dock.

VII. All vessels at anchor in the harbor, shall display a distinct white light forward not less than six feet above the forecastle deck during the night.

All vessels at anchor shall keep their foresails furled during the night.

VIII. Vessels ordered to quarantine shall be anchored on the northeasterly side of a line ranging with the United States Marine Hospital and Fort Gorges, which anchorage shall be designated as the "Quarantine Anchorage."*

IX. All steamers passing up and down the harbor, near the ends of the wharves, shall run at a low rate of speed.

X. All vessels lying across the end of any wharf, shall rig in their jib booms, or lay so that they shall not project over to obstruct the free passage of vessels to or from either side of the wharf.

XI. Vessels lying at the side of wharves, so as to obstruct the passage to adjoining wharves, must move when necessary to accommodate other vessels entering or leaving the docks.

XII. Light vessels lying alongside of a wharf, and not taking in or discharging cargo, must make way for and permit other vessels that want to load or unload cargo to come inside next to the wharf.

XIII. When fasts of vessels extend across a dock so as to obstruct passing vessels, the captain or person in charge shall cause the fasts to be slackened or cast off.

XIV. If any vessel occupying a berth at any wharf, either with or without the consent of the wharfinger thereof, shall fail to vacate such berth upon notice from such wharfinger or his agent, to the master or those having such vessel in charge for the time being, in a reasonable time, to be adjudged by the harbor master, the harbor master shall then cause such vessel to be moved to some other berth, or anchored in the stream, the expense thereof to be paid by the owners of said vessel.

XV. All square-rigged vessels shall cockbill their lower yards, brace their topsails and topgallant yards fore and aft, and rig in their jib booms, when directed by the harbor master to do so.

XVI. All schooners, sloops and other water craft of two and one-half tons measurement and over, shall display proper green and red lights at night when under way. All schooners, sloops and other boats, under two and one-half tons, including rowboats, shall display at night a white light at least two feet above the stem while in motion.

NEW HAMPSHIRE.

Extracts from the public statutes of New Hampshire, 1900, and in force January 1, 1901

CHAPTER 120.

PILOTAGE.

Commissioners of pilotage appointed.

Sec. 1. The governor and council may appoint three suitable persons to be commissioners of pilotage of the harbor and river of Piscataqua, who shall hold their office during the pleasure of the governor and council.

To make regulations.

Sec. 2. The commissioners may make such ordinances, rules, and regulations touching pilots and pilotage * * *.

To appoint pilots.

Sec. 3. They may prescribe the qualifications of pilots, and from time to time appoint and commission, under their hands and seals, so many pilots as they may judge necessary, and remove the same at pleasure, * * *.

Fees of pilotage.

Sec. 4. The governor and council * * * shall fix the fees of pilotage * * *. A table of such fees shall be attached to the commission of each pilot * * *.

Rights and duties of pilots.

Sec. 5. Any pilot appointed by the commissioners, who has given security for the faithful discharge of his duties, may take charge of any vessel, except coasting and fishing vessels of the United States of one hundred and fifty registered or enrolled tons and under, and except as provided in section six, and shall pilot such vessel into or out of the river and harbor of Piscataqua, first showing to the master thereof his appointment, if requested.

Masters may pilot their own vessels. Pilots' rights.

Sec. 6. Any master or owner may pilot his own vessel into and out of the Piscataqua River and harbor; but if a pilot shall speak and offer service to a vessel, excepting registered or enrolled vessels of the United States bound

* The quarantine anchorage is now designated by the boarding officer and is near House Island.

into said river or harbor, south of a line drawn east and west from Whale's-back lighthouse, or shall offer service to a vessel bound out of said river and harbor, excepting registered or enrolled vessels of the United States, before they leave the wharf, he shall be entitled to one half of the fees specified in his warrant in case the master or owner declines to employ him, and, on refusal of payment, may sue for and recover the same.

HARBOR CONTROL.

Ballast, etc., not to be thrown into the harbor.

Sec. 7. If any person shall unlade, cast, or throw out of any ship, vessel, or boat, or from the shore, or any wharf, any ballast, rubbish, gravel, earth, stones, dirt, ashes, or filth into the harbor or river of the Piscataqua between the lighthouse at the entrance of said harbor and the Boiling Rock, so called, up said river, or aid and assist therein, he shall forfeit not more than ten dollars, for the use of any person who will sue for the same.

HARBOR MASTERS.

Harbor master to be chosen.

Sec. 8. The city of Portsmouth shall annually choose a harbor master, whose duty it shall be to oversee said harbor and river, and to inquire into and prosecute for all offences under the preceding section.

His fees.

Sec. 9. The harbor master of the city of Portsmouth, when called upon to decide any question or controversy arising between the officers of the different vessels which may be lying at anchor in the harbor, or at the wharves of the city of Portsmouth, shall be entitled to a fee of not less than one dollar for his services, and the same shall be paid him by the officer of the vessel against whom he may decide.

CHAPTER 111.

QUARANTINE.

Quarantine regulations, how made.

Sec. 1. The power to establish quarantine in this state shall be vested in the state board of health, * * *.

All persons to give notice of disease.

Sec. 4. The master and officers of every vessel arriving at a port in this state having on board any person infected with the plague, smallpox, or any malignant, infectious, or pestilential disease, or who has been so infected during the voyage, or having on board any goods which may be reasonably supposed to have any infection of such disease, shall forthwith give notice thereof to the health officers or selectmen; and if the master or officers shall neglect to give such information, he shall be fined not exceeding five hundred dollars, or be imprisoned not exceeding three months, or both.

Vessels to perform quarantine.

Sec. 5. The health officers shall require all such vessels having on board any person infected with * * * malignant, infectious, or contagious disease, or who shall have been so infected during the voyage, or having on board any goods reasonably supposed to have any infection of such disease, to perform quarantine at such place as they shall appoint * * *.

Refusal to obey health regulations; penalty.

Sec. 6. Any owner, master, super-cargo, officer, seaman, consignee, or other person who shall refuse to obey the orders and regulations of the health officers in regard to quarantine or the purification and cleansing of the vessel and cargo, shall be fined not exceeding five hundred dollars, or be imprisoned not exceeding three months, or both.

Signal of quarantine.

Sec. 7. A red flag at least six feet in length shall be hoisted from sunrise to sunset at the head of the mainmast of any vessel ordered for quarantine, until the vessel shall be entirely cleansed * * *.

Bringing vessel to wharf; penalty.

Sec. 8. If any * * * person knowing such vessel to be subject to quarantine, shall bring the same or suffer the same to be brought to or near a wharf, or near a dwelling-house or store, or shall make a false declaration as to the port or place from which she came, or shall cause, or aid, or permit the landing of any person or property of any kind from the vessel without permission of the health officers, he shall be fined not exceeding five hundred dollars, or be imprisoned not exceeding three months, or both.

Vessels may be removed.

Sec. 9. If any such vessel shall not be removed to the place of quarantine agreeably to the directions of the health officers, * * * the health officers shall cause the vessel to be forthwith removed to the place, * * *. The expense of removal shall be paid by the master, owner, or consignee, who shall be severally liable therefor, and may be recovered by the health officers in the name of the town, with double costs.

Sec. 10. The health officers may seize any goods landed from the vessel without their permission, and remove and keep the same until they shall have caused them to be thoroughly cleansed. The expenses of the purification of the vessel and her cargo shall be paid by the master, owner, or consignee of the vessel, and they shall be severally liable therefor. Goods landed without leave may be seized.

Sec. 12. If any person shall come on shore from a vessel infected, or justly suspected to be so, or subject to or ordered for quarantine, or performing it, or shall leave the place appointed for the sick or for purification, being employed or placed there by the health officers, without their permission, he shall be punished by a fine of one hundred dollars, or by imprisonment for three months. Landing without leave; penalty.

CITY OF PORTSMOUTH.

Extracts from the compiled ordinances of the city of Portsmouth, 1886.

CHAPTER 27.

HARBOR CONTROL.

Sec. 1. The master, commander, or owners of every vessel shall, as soon as practicable after having hauled to the end of any wharf, cause his lower yards to be cockbilled, and her jib boom to be rigged in, so that the said jib boom may not annoy any other vessel or vessels going in or out of the adjoining docks; and the lower yards and jib boom shall be kept so arranged while such vessel lies at the end of the wharf as aforesaid, and until she is preparing immediately to leave her berth; and for every offence against any of the provisions of this section the master, commander, or owners, or either of them, of any such vessel, shall be subject to a penalty not exceeding ten dollars.

Sec. 2. No warp or line shall be passed across the mouth of any dock for any purpose, if the owners or occupants thereof object, unless the harbor master shall have decided it to be necessary; and for every offence against this provision, the master, commander, or owners of such vessel shall be subject to a penalty not exceeding five dollars.

Sec. 3. The harbor master shall have authority to regulate the mooring of all vessels in the harbor of Portsmouth, and when necessary to order the removal of such vessels, and to cause the same to be removed in obedience to such order at the expense of the master or owners thereof; and if any person shall obstruct said harbor master in the performance of any of his duties as prescribed by this ordinance, or shall neglect or refuse to obey any lawful order made by said harbor master, he shall be liable to a penalty not exceeding twenty dollars for each offence.

Sec. 4. No person shall throw or deposit in any part of the harbor of Portsmouth any stones, gravel, ballast, cinders, ashes, dirt, mud, or other substance which may in any respect tend to injure the navigation thereof; and whoever shall offend against the provisions of this section shall be subject to a penalty not exceeding ten dollars nor less than five dollars. And whenever any person on board of any vessel shall violate the provisions of this section, the master or owners of said vessel shall be liable to the penalty herein prescribed, as well as the person so offending.

Sec. 5. All the several penalties mentioned in this ordinance may be recovered by complaint before the police court of this city, to the use of any person who may make such complaint.

CHAPTER 11.

QUARANTINE.

Sec. 1. For the preservation of the public health, and to prevent the introduction of contagious and malignant diseases into this city, there shall be a regular system of quarantine established, and all vessels liable thereto, as designated in the succeeding sections, shall perform said quarantine in that part of the harbor of Piscataqua lying within a line drawn from Fort Constitution to the northwardmost of the Fishing Islands and a line drawn due west from Wood Island; and all such vessels on entering the harbor shall be brought to anchor on said grounds, and there wait the orders of the health officers.

Sec. 2. A quarantine shall be performed by all vessels, officers, crews, passengers, and cargoes which shall arrive within the harbor of the river Piscataqua and port of Portsmouth, on and after the thirty-first day of May, and until the first day of November, in each year, from any port or place between the latitude of Georgetown in South Carolina and the tropic of Capricorn; or from any other port or place where the malignant cholera, malignant fever, or other malignant or contagious diseases shall prevail, and by all vessels on board of which any sickness may have prevailed during their homeward passages. But no quarantine will be exacted of vessels coming from beyond the Cape of Good Hope or of vessels from the Cape de Verd Islands laden wholly with salt, unless contagious diseases

were known to have prevailed at those places at the time of their departure, or unless such vessels have had sickness on board during their voyage home.

Sec. 3. The board of health shall from time to time appoint a suitable person whose duty it shall be to board any vessel liable to perform quarantine, and to deliver to the master thereof a copy of the ordinances of this city relating to quarantine * * * for which service or permit he shall be entitled to receive three dollars from the master of such vessel.

Sec. 4. All vessels having on board any person infected with small pox, plague, pestilential or malignant fever, or other malignant, infectious or contagious disease, or who shall have been so infected during the voyage, or have on board any goods reasonably supposed to have any infection of such disease, shall perform quarantine at the place named in the first section of this chapter; and the master of any such vessel shall proceed with and anchor her at such place, there to be purified and cleansed, as the health officers may direct; and a suitable place on shore shall be prescribed and properly limited by the health officers for the purification of the cargo of such vessel.

Sec. 8. A red flag of at least six feet in length shall be hoisted and displayed, day and night, at the head of the mainmast of any vessel ordered for quarantine, until such vessel shall be entirely cleansed * * *.

Sec. 9. All pilots of the harbor of Piscataqua shall be duly notified of these regulations by the health officers, and said pilots shall make known these regulations to the masters of all vessels they shall board or to whom they shall have opportunity to communicate the same * * *.

Sec. 11. All fines and forfeitures for the violation of these regulations shall, on complaint of the health officers, be recovered by prosecution against the offenders * * *.

Sec. 12. The physician of the board of health shall be entitled to receive five dollars for each visit necessarily made to any vessel at quarantine needing to be cleansed, or on board of which shall be any person sick with any malignant, infectious, or contagious disease, and each of the other members of the board shall be entitled to receive three dollars for each such visit, to be paid by the master of such vessel; but no member shall receive pay for more than one visit on any one day.

APPENDIX III.

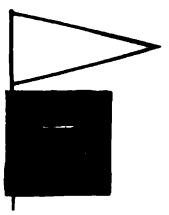
STORM WARNING DISPLAYS OF THE U. S. WEATHER BUREAU.

STORM DISPLAYS ALONG THE SEACOAST.

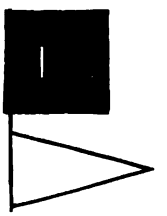
A red flag with a black center indicates that the storm is expected to be of marked violence.

The pennants displayed with the flags indicate the direction of the wind; red, easterly (from north through east to south); white, westerly (from south through west to north). The pennant above the flag indicates that the wind is expected to blow from the northerly quadrant; below, from the southerly quadrant.

STORM WARNING FLAGS.



Northwesterly winds.



Southwesterly winds.

Northeasterly winds.

Southeasterly winds.

By night a red light will indicate easterly winds and a white light above a red light will indicate westerly winds.

Hurricane.

The "**Hurricane Display**" denotes the expected approach of a hurricane or of one of the severe and dangerous storms that occasionally move across the Gulf of Mexico and along the Atlantic Coast.

APPENDIX IV.

REGULATIONS U. S. PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

APPROVED NOVEMBER 21, 1902.

(*Extracts.*)

DUTIES OF COMMISSIONED OFFICERS.

PROFESSIONAL DUTIES.

116. The professional duties of commissioned officers are to examine all applicants for relief, to prescribe for and furnish out-patient or hospital treatment as may be required, and to make physical examinations of the seamen of the several Government services and the merchant marine, under such regulations as shall hereinafter appear.

Professional duties defined.

117. Commissioned officers will, upon the application of the United States shipping commissioner, or of the master or owner of any United States vessel engaged in the foreign, coastwise, or inland navigation trade, examine as to his physical condition any seaman brought to them for that purpose, and will give a certificate as to his fitness or unfitness for service. They will physically examine, in accordance with existing regulations governing physical examinations, any foreign seamen sent them for that purpose by the duly authorized agent of a foreign line or by the consul representing the nation to which the vessel belongs. A fee of $1 will be charged for each examination of a foreign seaman, and fees so received will be deposited with the collector of customs in the same manner as donations to the marine-hospital fund. Officers will also, upon the application of the proper authority, examine cadets, enlisted men, and persons desiring to enlist in the Revenue-Cutter, Life-Saving, Coast-Survey, and Light-House services, or to instruct them in the mode of resuscitating persons apparently drowned. No fee will be charged for this service. They will also examine alien immigrants when detailed for that purpose. They will also, when officially requested, furnish to commanding officers of revenue cutters certificates as to the physical condition of enlisted men of the Revenue-Cutter Service who may be under treatment in hospital or as out-patients. * * *

To examine seamen, cadets, enlisted men, etc., as to their physical condition.

119. Whenever officially requested by the local inspectors of steam vessels or other proper officers, commissioned officers will examine applicants for pilot's license as to sense of hearing, color perception, and general visual capacity, and will give a certificate accordingly.

To examine applicants for pilot's license.

120. No fee will be charged by any officer of the Public Health and Marine-Hospital Service for the medical examination or professional treatment of seamen of the United States merchant marine or for making a certificate as to their physical condition, and no officer shall accept a fee for professional service relating to the public service.

No fee to be charged.

SANITARY DUTIES.

123. It shall be the duty of commissioned officers to enforce the national health and quarantine laws and regulations; but no additional compensation shall be allowed said officers by reason of such service as they may be required to perform except actual and necessary traveling expenses.

To enforce national quarantine rules and regulations. Apr. 29, 1878, s. 3; Feb. 15, 1893.

127. Upon the outbreak of smallpox at or near a relief station, commissioned officers will vaccinate such seamen as may come to the marine-hospital officer for the purpose; and officers are authorized at all times to visit vessels to examine and vaccinate crews.

To vaccinate seamen.

RELIEF STATIONS.

Definition.

404. A relief station of the Public Health and Marine-Hospital Service is a port or place where an officer of the Service is on duty to extend relief to seamen, or where an officer of the customs service is specifically authorized to extend said relief.

Classes.

405. Relief stations shall be divided into the following classes:

Class I. United States marine hospitals.

Class II. All other stations under command of a commissioned officer.

Class III. All stations under charge of an acting assistant surgeon where there is a contract for the care of sick and disabled seamen.

Class IV. All other relief stations not included in the above classes.

Provisions for relief.

406. At all relief stations where the number of patients warrants, an officer of the Service will be assigned to the command of the station, and whenever practicable the patients of the Service will be treated in hospitals maintained exclusively for their benefit. * * *

Provision for marine-hospital dispensaries.

408. At each relief station of the first and second class, and whenever practicable at each relief station of the third class where an acting assistant surgeon of the Service is on duty, there shall be a marine-hospital office, where applicants for relief shall be received and examined, and the necessary action taken according to the regulations.

Location of offices and dispensaries.

409. The marine-hospital office shall be located at the custom-house whenever practicable and suitable office room for that purpose shall be set apart by the custodian of the custom-house building, subject to the approval of the Secretary of the Treasury.

BENEFICIARIES.

Persons entitled to relief.

411. The persons entitled to the benefits of the Public Health and Marine-Hospital Service are those employed on board in the care, preservation, or navigation of any registered, enrolled, or licensed vessel of the United States, or in the service on board of those engaged in such care, preservation, or navigation. Officers and crews of the Light-House Establishment, officers and crews of the Revenue-Cutter Service, seamen employed on the vessels of the Mississippi River Commission, seamen employed on the vessels of the Engineer Corps of the Army, and keepers and crews of the United States Life-Saving Service are entitled to the facilities of the hospitals and relief stations under special rules hereinafter prescribed.

Coast and Geodetic Survey entitled to relief.

412. Officers on vessels of the Coast and Geodetic Survey and seamen thereon, who are not enlisted men from the Navy, are entitled to the benefits of the Service.

Yachtsmen entitled.

413. Seamen employed on yachts are entitled to treatment, provided the said yachts are enrolled, licensed, or registered as vessels of the United States.

Seamen on United States Army transports, etc., entitled to treatment.

414. Seamen employed on United States Army transports or other vessels belonging to the Quartermaster's Department, United States Army, when not enlisted men of the Army, are entitled to the benefits of the Service.

Exceptions, R. S., s. 4804.

415. No person employed in or connected with the navigation, management, or use of canal boats engaged in the coasting trade shall, by reason thereof, be entitled to any benefit or relief from the Service.

Wrecked seamen entitled.

417. Seamen taken from wrecked vessels of the United States are entitled to the benefits of the Service if sick or disabled, and will be furnished care and treatment without reference to the length of time they have been employed.

Seamen sent by consular officers entitled. U. S. Rev. Stat., s. 4577.

418. Seamen employed on merchant vessels of the United States returned to the United States from foreign ports by United States consular officers, if sick or disabled at the time of their arrival in a port of the United States, shall be entitled to the benefits of the Service without reference to length of service.

Seamen must make application for relief.

419. A sick or disabled seaman, in order to obtain the benefits of the Service, must apply in person, or by proxy if too sick or disabled so to do, at the office of the Public Health and Marine-Hospital Service, to an officer of that Service, or to the proper customs officer acting as the agent of the said Service at stations where no medical officer is on duty, and must furnish satisfactory evidence that he is entitled to relief under the regulations.

Evidence to be presented by applicant.

420. Master's certificates and discharges from United States shipping commissioners, made out and signed in proper form, showing that the applicant for relief has been employed for sixty days of continuous service "in a registered, enrolled, or licensed vessel of the United States," a part of which

must have been during the sixty days immediately preceding his application for relief, shall entitle him to treatment. The phrase "sixty days continuous service" shall not be held to exclude seamen whose papers show brief intermission between short services that aggregate the required sixty days.

U. S. Rev. Stat., 4803.

421. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seaman on said vessel may be accepted as evidence in lieu of the master's certificate in cases where the latter is not procurable.

Certificates from owners or agents as evidence.

422. Masters of documented vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessel a certificate (Form 1915) of the length of time said seaman has been so employed, giving the dates of such employment. This certificate will be filed in the marine-hospital office or office of the customs officer when application is made for relief, whether the relief is furnished or the claim rejected.

Masters must furnish certificate of service.

423. Any master of a vessel or other person who shall furnish a false certificate of service, with intent to procure the admission of a seaman into any marine hospital, shall be immediately reported to the nearest United States attorney for prosecution.

False certificates.

424. When an interval has occurred in the applicant's seafaring service by reason of the closure of navigation on account of ice or low water, such interval shall not be considered as excluding him from relief unless the sickness or injury for which he applies for relief be the direct result of employment on shore.

Exceptions.

425. During the season when navigation is closed at any port, by reason of ice or low water, seamen applying for relief at such ports shall be entitled to same, provided they present the documentary evidence required in paragraph 420, which must show that the applicants were employed within sixty days immediately preceding the said closure of navigation, and provided it does not appear that the disease or injury is the result of employment on shore, or the result of vicious habits.

Closure of navigation.

426. The time during which a seaman has been under treatment in hospital as a patient of the Service shall not be reckoned as absence from vessel in respect to debarring him from further relief.

Period of treatment not to be reckoned as absence from vessel.

427. Whenever an applicant for relief presents himself at the marine-hospital office or the custom-house without a master's certificate or shipping commissioner's discharge and it is impracticable to obtain such certificate, the affidavit of the applicant as to the facts of his last employment, stating names of vessels and dates of service, may be accepted as evidence in support of his claim for the benefits of the Service.

Affidavits may be accepted as evidence.

428. When the period of the seaman's service as shown by his certificate on last vessel is less than sixty days, his affidavit as to previous service may be accepted.

Brief service on last vessel not a bar to relief.

431. When a seaman applies for relief after an absence of sixty days or more from his last vessel, and it satisfactorily appears that such absence was due to sickness or injury acquired in the line of duty, and that it was impracticable for him to apply to the proper officer for treatment, a statement of the facts, together with a copy of the application and other papers in support of same, shall be forwarded, with the recommendation of the medical officer, to the Surgeon-General for decision.

Applications for relief after sixty days' absence from vessel.

432. Any seaman who is able to write will be expected to sign his name upon the face of the master's certificate issued to him before said certificate is signed by the master of the vessel. * * *

Seamen to sign certificates.

434. When a seaman who has received continuous treatment at the out-patient office for a period of two months applies for further treatment he must, to entitle him to treatment, furnish a new certificate of service, showing that he is still following his vocation as seaman, or give satisfactory evidence that such service has been prevented by closure of navigation or by sickness, the latest dates of service and, in case of lack of recent service, its explanation, to appear in each new relief certificate.

Out-patients to furnish new service certificates.

435. The expenses of caring for sick and disabled seamen incurred during a voyage will not be paid by the Service.

Expenses for sickness during voyage.

436. The expenses for the care and treatment of seamen suffering from contagious diseases, who are entitled to the benefits of the Service, and who, in accordance with the State or municipal health laws and regulations are taken to quarantine or other hospitals under charge of the local health authorities, will not be paid unless such seamen were admitted at the time by the request of an officer of the Service.

Seamen admitted to local quarantine hospitals.

Money not to be paid to seamen for expenses of sickness.

437. In no case shall money be paid to a seaman or to his family or friends by the Service as reimbursement for expenses incurred during his sickness or disability.

Seamen injured in brawls not to receive treatment.

439. Seamen who may be injured in street brawls or while committing a breach of the peace, and are therefore confined in jail or taken to civil hospitals by the local authorities for such acts, shall not receive treatment at the expense of the Service.

Seamen taken ill on vessel entitled.

440. Seamen taken sick or injured while actually employed on a documented vessel shall be entitled to treatment at relief stations without reference to the length of their service.

Certificates of discharge.

441. A certificate of discharge may, at the discretion of the officer in charge of the case, be given to a hospital patient, but such certificate when presented at another relief station shall not be taken as sufficient evidence of the applicant's title to marine-hospital relief, but may be considered as collateral to other satisfactory data submitted by the seaman.

Only temporary relief contemplated.

442. Temporary relief only is contemplated, and admission to hospital is not intended to permit an indefinite residence therein for cause other than actual disease or injury.

THE REVENUE-CUTTER SERVICE.

Admitted without regard to length of service.

444. The officers and crews of the Revenue-Cutter Service will receive hospital or out-patient treatment, as hereinafter provided, on certificate signed by the commanding officer or executive officer of a revenue cutter, without regard to length of service. The certificate shall contain a description of the applicant for relief. Officers on leave or waiting orders may sign their own certificate.

THE ENGINEER CORPS, UNITED STATES ARMY.

Seamen employed on vessels of the Engineer Corps, U. S. A., entitled.

453. Seamen employed on vessels under the charge of the Engineer Corps of the United States Army shall be admitted to the benefits of the Marine-Hospital Service without charge at stations of the first, second, and third class upon the written request of the commanding officers of said vessels.

THE LIGHT-HOUSE SERVICE.

Officers and crews of the Light-House Establishment entitled.

460. Officers and crews of the several vessels belonging to the Light-House Establishment, including light-ships, may be admitted to the benefits of the Public Health and Marine-Hospital Service upon the application of their respective commanding officers. No charge will be made for care and treatment.

UNITED STATES ARMY AND NAVY.

Officers and seamen of various Government services may be admitted.

461. Officers and enlisted men of the United States Army and Navy may be admitted for care and treatment as patients of the service only upon the written request of their respective commanding officers. Every such admission shall be immediately reported to the Surgeon-General by the officer in charge of the station, on a daily report (Form 1957) or relief certificate (Form 1916), accompanied by a copy of the request upon which such officer or enlisted man was admitted. They shall be furnished treatment at stations of the first, second, and third class only. The rate of charge to be made for the care and treatment of the said officers and enlisted men will be fixed by the Department at the beginning of each fiscal year, and will be announced to officers and others in the annual circular entitled "Contracts for care of seamen." Patients of the above-named class are not subject to the provisions requiring transportation to marine hospitals.

FOREIGN SEAMEN.

Foreign seamen may be treated. Sec. 6, act Mar. 3, 1875; 18 Stat. L., 485.

462. The accommodations provided for the care and treatment of the patients of the Public Health and Marine-Hospital Service are also available to foreign seamen at relief stations of the first, second, and third class upon the application of the consular officer of the nation under whose flag they are sailing; or upon the application of the masters of the vessels upon which said seamen serve, provided satisfactory written security is given for the payment of the expenses of such care and treatment, at rates fixed annually by the Department.

463. A bill (Form 1928) in duplicate must be rendered by the officer of the Service * * *. One copy of this bill shall be delivered to the collector of customs, who shall at once collect the amount * * *. Bills for care and treatment. Form 1928.

464. Customs officers acting as agents of the Public Health and Marine-Hospital Service shall collect all bills for the care and treatment of seamen of the classes enumerated in paragraphs 461 and 462 * * *. Monthly accounts to be rendered.

465. Collectors of customs will notify the commanding officer of the vessel of the class enumerated in paragraphs 461 and 462, upon whose request the seaman was admitted, of the amount of the bill, and when paid will give a receipt therefor. * * * Notification of amount of bill.

466. The rate of charge to be made for the care and treatment of foreign seamen will be fixed by the Department at the beginning of each fiscal year, and will be announced to officers and others in the annual circular entitled "Contracts for care of seamen." Foreign seamen are not subject to the provision of paragraphs 493 and 501 requiring transportation to marine hospitals. Charges for care and treatment.

RELIEF.

OUT-PATIENT RELIEF.

467. Sick and disabled seamen entitled under these regulations to the benefits of the Service whose diseases or injuries are of such a nature that they can properly be relieved by medicines, dressings, or advice, without admission to hospital, shall be treated as out-patients, and furnished medicines, dressings, surgical appliances, or advice, as the case may require. Cases to be treated as out-patients.

468. Seamen will not be furnished relief at their own homes, except by special authority from the Surgeon General, and then only an allowance for medical attendance and medicines will be made at rates fixed by the Treasury Department. No relief furnished at homes of patients.

HOSPITAL RELIEF.

480. A sick or disabled seaman entitled to the benefits of the Service shall be admitted to hospital only in cases where the gravity of the disease or injury from which he suffers is such as to require hospital treatment in the opinion of an officer of the Service, or of a reputable physician designated by the Department to act at a place where no officer is stationed. Cases for hospital treatment.

STATIONS OF THE FIRST CLASS.

483. A bed ticket (Form 1919) shall be prepared and delivered to the applicant for relief in a sealed envelope addressed to the officer or other person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the ticket will be invalid. To be valid only for day of issue.

STATIONS OF THE SECOND CLASS.

491. A bed ticket (Form 1919) shall be prepared and delivered to the applicant for relief in a sealed envelope addressed to the officer or other person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the ticket will be invalid. To be valid only for day of issue.

STATIONS OF THE THIRD CLASS.

499. Customs officers, or acting assistant surgeons, when in charge of the station by special authority of the Bureau, shall issue hospital permits for the care and treatment of such applicants as may be found to be entitled to the benefits of the Service and require hospital treatment. The period for which treatment is authorized by the permit * * * should in no case exceed twenty days. Permits for hospital relief.

STATIONS OF THE FOURTH CLASS.

512. Customs officers, or acting assistant surgeons, when in charge of the station by special authority of the Bureau, shall issue hospital permits for the care and treatment of such applicants as may be found to be entitled to the benefits of the Service and require hospital treatment. The period for which treatment is authorized by the permit * * * should in no case exceed twenty days. Permits for hospital relief.

Permits valid only on day of issue.

515. The hospital permit, before being delivered to the applicant for relief, must be inclosed in an envelope, sealed, and addressed to the person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the permit will be invalid.

Foreign seamen et al. not treated.

479. Foreign seamen or employees of the various Government services, not beneficiaries, shall not be treated.

INSANE SEAMEN.

Relief for insane seamen. Mar. 3, 1875.

531. Insane seamen entitled to the benefits of the Service may be admitted to the Government Hospital for the Insane, Washington, D. C., upon the order of the Secretary of the Treasury.

DECEASED SEAMEN.

Relatives to be notified.

538. On the death of a patient while under the charge of the Service, notice to receive his effects shall be given by letter or otherwise to his nearest known relative. * * *

Burial expenses.

539. The necessary expenses of a plain burial for deceased patients of the Service will be paid, but no part of the expenses of the burial of any deceased seaman will be paid for at the expense of the Marine-Hospital Service unless said seaman was at the time of his death a patient of the Service. When friends or relatives of a deceased seaman claim the body and assume charge of the funeral arrangements, no part of the expenses of the same will be paid by the Marine-Hospital Service.

NATIONAL QUARANTINES.

QUARANTINE LAWS.

AN ACT granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service.

(*Extracts.*)

[Approved February 15, 1893, and amended August 18, 1894, and March 2, 1901.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any merchant ship or other vessel from any foreign port or place of [to] enter any port of the United States except in accordance with the provisions of this act and with such rules and regulations of State and municipal health authorities as may be made in pursuance of, or consistent with, this act; and any such vessel which shall enter, or attempt to enter, a port of the United States in violation thereof shall forfeit to the United States a sum, to be awarded in the discretion of the court, not exceeding five thousand dollars, which shall be a lien upon said vessel, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

SEC. 2. That any vessel at any foreign port clearing for any port or place in the United States shall be required to obtain from the consul, vice-consul, or other consular officer of the United States at the port of departure, or from the medical officer where such officer has been detailed by the President for that purpose, a bill of health, in duplicate, in the form prescribed by the Secretary of the Treasury, setting forth the sanitary history and condition of said vessel, and that it has in all respects complied with the rules and regulations in such cases prescribed for securing the best sanitary condition of the said vessel, its cargo, passengers, and crew; and said consular or medical officer is required, before granting such duplicate bill of health, to be satisfied that the matters and things therein stated are true; and for his services in that behalf he shall be entitled to demand and receive such fees as shall by lawful regulation be allowed, to be accounted for as is required in other cases.

The President, in his discretion, is authorized to detail any medical officer of the Government to serve in the office of the consul at any foreign port for the purpose of furnishing information and making the inspection and giving the bills of health hereinbefore

mentioned. Any vessel clearing and sailing from any such port without such bill of health, and entering any port of the United States, shall forfeit to the United States not more than five thousand dollars, the amount to be determined by the court, which shall be a lien on the same, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

The provisions of this section shall not apply to vessels plying between foreign ports on or near the frontiers of the United States and ports of the United States adjacent thereto; but the Secretary of the Treasury is hereby authorized, when, in his discretion, it is expedient for the preservation of the public health, to establish regulations governing such vessels.

SEC. 5. That the Secretary of the Treasury shall from time to time issue to the consular officers of the United States and to the medical officer serving at any foreign port, and otherwise make publicly known, the rules and regulations made by him, to be used and complied with by vessels in foreign ports, for securing the best sanitary condition of such vessels, their cargoes, passengers, and crew, before their departure for any port in the United States, and in the course of the voyage; and all such other rules and regulations as shall be observed in the inspection of the same on the arrival thereof at any quarantine station at the port of destination, and for the disinfection and isolation of the same, and the treatment of cargo and persons on board, so as to prevent the introduction of cholera, yellow fever, or other contagious or infectious diseases; and it shall not be lawful for any vessel to enter said port to discharge its cargo, or land its passengers, except upon a certificate of the health officer at such quarantine station certifying that said rules and regulations have in all respects been observed and complied with, as well on his part as on the part of the said vessel and its master, in respect to the same and to its cargo, passengers, and crew; and the master of every such vessel shall produce and deliver to the collector of customs at said port of entry, together with the other papers of the vessel, the said bills of health required to be obtained at the port of departure and the certificate herein required to be obtained from the health officer at the port of entry; and that the bills of health herein prescribed shall be considered as part of the ship's papers, and when duly certified to by the proper consular officer or other officer of the United States, over his official signature and seal, shall be accepted as evidence of the statements therein contained in any court of the United States.

SEC. 6. That on the arrival of an infected vessel at any port not provided with proper facilities for treatment of the same, the Secretary of the Treasury may remand said vessel, at its own expense, to the nearest national or other quarantine station, where accommodations and appliances are provided for the necessary disinfection and treatment of the vessel, passengers, and cargo; and after treatment of any infected vessel at a national quarantine station, and after certificate shall have been given by the United States quarantine officer at said station that the vessel, cargo, and passengers are each and all free from infectious disease, or danger of conveying the same, said vessel shall be admitted to entry to any port of the United States named within the certificate. But at any ports where sufficient quarantine provision has been made by State or local authorities the Secretary of the Treasury may direct vessels bound for said ports to undergo quarantine at said State or local station.

SEC. 7. That whenever it shall be shown to the satisfaction of the President that by reason of the existence of cholera or other infectious or contagious diseases in a foreign country there is serious danger of the introduction of the same into the United States, and that notwithstanding the quarantine defense this danger is so increased by the introduction of persons or property from such country that a suspension of the right to introduce the same is demanded in the interest of the public health, the President shall have power to prohibit, in whole or in part, the introduction of persons and property from such countries or places as he shall designate, and for such period of time as he may deem necessary.

SEC. 10. That the Supervising Surgeon General, with the approval of the Secretary of the Treasury, is authorized to designate and mark the boundaries of the quarantine grounds and quarantine anchorages for vessels which are reserved for use at each United States quarantine station; and any vessel or officer of any vessel or other person, other than State or municipal health or quarantine officers, trespassing or otherwise entering upon such grounds or anchorages in disregard of the quarantine rules and regulations, or without permission of the officer in charge of such station, shall be deemed guilty of a misdemeanor and subject to arrest, and upon conviction thereof be punished by a fine of not more than three hundred dollars or imprisonment for not more than one year, or both, in the discretion of the court. Any master or owner of any vessel, or any person violating any provision of this Act or any rule or regulation made in accordance with this Act, relating to inspection of vessels or relating to the prevention of the introduction of contagious or infectious diseases, or any master, owner, or agent of any vessel making a false statement relative to the sanitary condition of said vessel or its contents or as to the health of any passenger or person thereon, shall be deemed guilty of a misdemeanor and subject to arrest, and upon conviction thereof be punished by a fine of not more than five hundred dollars or imprisonment for not more than one year, or both, in the discretion of the court.

SEC. 11. That any vessel sailing from any foreign port without the bill of health required by section two of this Act, and arriving within the limits of any collection district of the United States, and not entering or attempting to enter any port of the United States, shall be subject to such quarantine measures as shall be prescribed by regulations of the Secretary of the Treasury, and the cost of such measures shall be a lien on said vessel, to be recovered by proceedings in the proper district court of the United States and in the manner set forth above as regards vessels from foreign ports without bills of health and entering any port of the United States.

QUARANTINE REGULATIONS.

(*Extracts.*)

INSPECTION OF VESSELS LEAVING FOREIGN PORTS AND PORTS IN THE POSSESSIONS OR OTHER DEPENDENCIES OF THE UNITED STATES FOR PORTS IN THE UNITED STATES OR ITS POSSESSIONS OR OTHER DEPENDENCIES.

5. The officer issuing the bill of health shall satisfy himself, by inspection if necessary, that the conditions certified to therein are true, and is authorized, in accordance with the law, to withhold the bill of health or the supplemental bill of health until he is satisfied that the vessel, the passengers, the crew, and the cargo have complied with all the quarantine laws and regulations of the United States.

6. Inspection is required of—

(*a*) All vessels from ports at which cholera, yellow fever, or plague prevails, or at which smallpox or typhus fever prevails in epidemic form.

(*b*) All vessels carrying steerage passengers; but need only include the inspection of such passengers and their living apartments, if sailing from a healthy port.

7. Inspection of the vessel is such an examination of the vessel, cargo, passengers, crew, personal effects of same, including examination of manifests and other papers, food and water supply, the ascertainment of its relations with the shore, the manner of loading and possibilities of invasion by small animals as will enable the inspecting officer to determine if these regulations have been complied with.

8. When an inspection is required, it should be made by daylight, as late as practicable before sailing. The vessel should be inspected before the passengers go aboard, the passengers just before embarkation, and the crew on deck; and no communication should be had with the vessel after such inspection except by permission of the officer issuing the bill of health.

INSPECTION.

59. Every vessel subject to quarantine inspection, entering a port of the United States, its possessions or dependencies, shall be considered in quarantine until given free pratique. Such vessel shall fly a yellow flag at the foremast head from sunrise to sunset, and shall observe all the other requirements of vessels actually quarantined.

60. Vessels arriving at ports of the United States under the following conditions shall be inspected by a quarantine officer prior to entry:

(*a*) All vessels from foreign ports except those enumerated in paragraph 4.

(*b*) Any vessel with sickness on board.

(*c*) Vessels from domestic ports where cholera, plague, or yellow fever prevails, or where smallpox or typhus fever prevails in epidemic form.

(*d*) Vessels from ports suspected of infection with yellow fever, having entered a port north of the southern boundary of Maryland without disinfection, shall be subjected to a second inspection before entering any ports south of said latitude during the quarantine season of such port.

61. The inspections of vessels required by these regulations shall be made between sunrise and sunset, except in case of vessels in distress.

64. No person, except the quarantine officer, his employees, United States customs officers, pilots, or other persons authorized by the quarantine officer, shall be permitted to board any vessel subject to quarantine inspection until after the vessel has been inspected by the quarantine officer and granted free pratique, and all such persons so boarding such vessel shall, in the discretion of the quarantine officer, be subject to the same restrictions as the personnel of the vessel.

65. Towboats or any other vessels having had communication with vessels subject to inspection shall themselves be subject to inspection.

QUARANTINE.

68. Vessels arriving under the following conditions shall be placed in quarantine:

(*a*) With quarantinable disease on board or having had such disease on board during the voyage.

(*b*) Any vessel which the quarantine officer considers infected.

(*c*) If arriving at a port south of the southern boundary of Maryland in the season of close quarantine, May 1 to November 1, directly or via a northern port, from a tropical American port, unless said port is known to be free from yellow fever.

(*d*) In case of vessels arriving at a northern port without sickness on board from ports where yellow fever prevails, the personnel shall be detained under observation at quarantine to complete five days from the port of departure.

(*e*) Towboats and other vessels having had communication with vessels subject to quarantine shall themselves be quarantined if they have been exposed to infection.

69. Vessels arriving under the following conditions need not be subject to quarantine:

A. Vessels from yellow fever ports bound for ports in the United States north of the southern boundary of Maryland, with good sanitary condition and history, having had no sickness on board at ports of departure, en route or on arrival, provided they have been five days from last infected or suspected port.

B. Vessels engaged in the fruit trade may be admitted to entry without detention, provided that they have complied in all respects with the special rules and regulations made by the Secretary of the Treasury with regard to vessels engaged in said trade.

GENERAL REQUIREMENTS AT QUARANTINE.

71. No direct communication shall be allowed between any vessel in quarantine and any person or place outside, and no communication whatever between quarantine or any vessel in quarantine and any person or place outside except under the supervision of the quarantine officer.

SPECIAL REGULATIONS RELATING TO NAVAL VESSELS.

151. Vessels of the U. S. Navy may be granted the hereinafter stated exemptions from quarantine regulations, but are subject to quarantine inspection upon arrival at a port of the United States.

152. The certificates of the medical officers of the U. S. Navy as to the sanitary history and condition of the vessel and its personnel may be accepted for naval vessels by the quarantine officer boarding the vessel in lieu of an actual inspection.

153. Vessels of the U. S. Navy having entered the harbors of infected ports, but having held no communication which is liable to convey infection, may be exempted from the disinfection and detention imposed on merchant vessels from such ports.

APPENDIX V.

RULES TO PREVENT COLLISIONS OF VESSELS.

Compiled for insertion in volumes of the U. S. Coast Pilot, Atlantic Coast.

AN ACT in regard to collisions at sea.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in every case of collision between two vessels it shall be the duty of the master or person in charge of each vessel, if and so far as he can do so without serious danger to his own vessel, crew, and passengers (if any), to stay by the other vessel until he has ascertained that she has no need of further assistance, and to render to the other vessel, her master, crews and passengers (if any), such assistance as may be practicable and as may be necessary in order to save them from any danger caused by the collision, and also to give to the master or person in charge of the other vessel the name of his own vessel and her port of registry, or the port or place to which she belongs, and also the names of the ports and places from which and to which she is bound. If he fails so to do, and no reasonable cause for such failure is shown, the collision shall, in the absence of proof to the contrary, be deemed to have been caused by his wrongful act, neglect, or default.

SEC. 2. That every master or person in charge of a United States vessel who fails, without reasonable cause, to render such assistance or give such information as aforesaid shall be deemed guilty of a misdemeanor, and shall be liable to a penalty of one thousand dollars, or imprisonment for a term not exceeding two years; and for the above sum the vessel shall be liable and may be seized and proceeded against by process in any district court of the United States by any person; one-half such sum to be payable to the informer and the other half to the United States.

SEC. 3. That this act shall take effect at a time to be fixed by the President by Proclamation issued for that purpose.

Approved September 4, 1890. Proclamation dated November 18, 1890, to take effect December 15, 1890.

INTERNATIONAL RULES.

I.—ENACTING CLAUSE, AND SCOPE.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following regulations for preventing collisions at sea shall be followed by all public and private vessels of the United States upon the high seas and in all waters connected therewith, navigable by sea-going vessels.

ART. 30. Nothing in these rules shall interfere with the operation of a special rule, duly made by local authority, relative to the navigation of any harbor, river, or inland waters.

PRELIMINARY DEFINITIONS.

In the following rules every steam-vessel which is under sail and not under steam is to be considered a sailing-vessel, and every vessel under steam, whether under sail or not, is to be considered a steam-vessel.

The word "steam-vessel" shall include any vessel propelled by machinery.

A vessel is "under way" within the meaning of these rules when she is not at anchor, or made fast to the shore, or aground.

II.—LIGHTS AND SO FORTH.

The word "visible" in these rules when applied to lights shall mean visible on a dark night with a clear atmosphere.

ART. 1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

STEAM VESSELS—MASTHEAD LIGHT.

ART. 2 A steam-vessel when under way shall carry—(*a*) On or in front of the foremast, or if a vessel without a foremast, then in the fore part of the vessel, at a height above the hull of not less than twenty feet, and if the breadth of the vessel exceeds twenty feet, then at a height above the hull not less than such breadth, so, however, that the light need not be carried at a greater height above the hull than forty feet, a bright white light, so constructed as to show an unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side, and of such a character as to be visible at a distance of at least five miles.

STEAM VESSELS—SIDE LIGHTS.

(*b*) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least two miles.

(*c*) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible at a distance of at least two miles.

(*d*) The said green and red side-lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

STEAM VESSELS—RANGE LIGHTS.

(*e*) A steam-vessel when under way may carry an additional white light similar in construction to the light mentioned in subdivision (*a*). These two lights shall be so placed in line with the keel that one shall be at least fifteen feet higher than the other, and in such a position with reference to each other that the lower light shall be forward of the upper one. The vertical distance between these lights shall be less than the horizontal distance.

STEAM VESSELS WHEN TOWING.

ART. 3. A steam-vessel when towing another vessel shall, in addition to her side-lights, carry two bright white lights in a vertical line one over the other, not less than six feet apart, and when towing more than one vessel shall carry an additional bright white light six feet above or below such light, if the length of the tow measuring from the stern of the towing vessel to the stern of the last vessel towed exceeds six hundred feet. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in article two (*a*), excepting the additional light, which may be carried at a height of not less than fourteen feet above the hull.

Such steam-vessel may carry a small white light abaft the funnel or aftermast for the vessel towed to steer by, but such light shall not be visible forward of the beam.

SPECIAL LIGHTS.

ART. 4. (*a*) A vessel which from any accident is not under command shall carry at the same height as a white light mentioned in article two (*a*), where they can best be seen, and if a steam-vessel in lieu of that light, two red lights, in a vertical line one over the other, not less than six feet apart, and of such a character as to be visible all around the horizon at a distance of at least two miles; and shall by day carry in a vertical line one over the other, not less than six feet apart, where they can best be seen, two black balls or shapes, each two feet in diameter.

(*b*) A vessel employed in laying or in picking up a telegraph cable shall carry in the same position as the white light mentioned in article two (*a*), and if a steam-vessel in lieu of that light, three lights in a vertical line one over the other not less than six feet apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all around the horizon at a distance of at least two miles. By day she shall carry in a vertical line, one over the other, not less than six feet apart, where they can best be seen, three shapes not less than two feet in diameter, of which the highest and lowest shall be globular in shape and red in color, and the middle one diamond in shape and white.

(*c*) The vessels referred to in this article, when not making way through the water, shall not carry the side-lights, but when making way shall carry them.

(*d*) The lights and shapes required to be shown by this article are to be taken by other vessels as signals that the vessel showing them is not under command and can not therefore get out of the way.

These signals are not signals of vessels in distress and requiring assistance. Such signals are contained in article thirty-one.

LIGHTS FOR SAILING VESSELS AND VESSELS IN TOW.

ART. 5. A sailing-vessel under way and any vessel being towed shall carry the same lights as are prescribed by article two for a steam-vessel under way, with the exception of the white lights mentioned therein, which they shall never carry.

LIGHTS FOR SMALL VESSELS.

ART. 6. Whenever, as in the case of small vessels under way during bad weather, the green and red side-lights can not be fixed, these lights shall be kept at hand, lighted and ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable, more than two points abaft the beam on their respective sides. To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

LIGHTS FOR SMALL STEAM AND SAIL VESSELS AND OPEN BOATS.

ART. 7. Steam-vessels of less than forty, and vessels under oars or sails of less than twenty tons gross tonnage, respectively, and rowing boats, when under way, shall not be required to carry the lights mentioned in article two (*a*), (*b*), and (*c*), but if they do not carry them they shall be provided with the following lights:

First. Steam-vessels of less than forty tons shall carry—

(*a*) In the fore part of the vessel, or on or in front of the funnel, where it can best be seen, and at a height above the gunwale of not less than nine feet, a bright white light constructed and fixed as prescribed in article two (*a*), and of such a character as to be visible at a distance of at least two miles.

(*b*) Green and red side-lights constructed and fixed as prescribed in article two (*b*) and (*c*), and of such a character as to be visible at a distance of at least one mile, or a combined lantern showing a green light and a red light from right ahead to two points abaft the beam on their respective sides. Such lanterns shall be carried not less than three feet below the white light.

Second. Small steamboats, such as are carried by seagoing vessels, may carry the white light at a less height than nine feet above the gunwale, but it shall be carried above the combined lantern mentioned in subdivision one (*b*).

Third. Vessels under oars or sails of less than twenty tons shall have ready at hand a lantern with a green glass on one side and a red glass on the other, which, on the approach of or to other vessels, shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

Fourth. Rowing boats, whether under oars or sail, shall have ready at hand a lantern showing a white light which shall be temporarily exhibited in sufficient time to prevent collision.

The vessels referred to in this article shall not be obliged to carry the lights prescribed by article four (*a*) and article eleven, last paragraph.

LIGHTS FOR PILOT VESSELS.

ART. 8. Pilot-vessels when engaged on their station on pilotage duty shall not show the lights required for other vessels, but shall carry a white light at the masthead, visible all around the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed fifteen minutes.

On the near approach of or to other vessels they shall have their side-lights lighted, ready for use, and shall flash or show them at short intervals, to indicate the direction in which they are heading, but the green light shall not be shown on the port side, nor the red light on the starboard side.

A pilot-vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board may show the white light instead of carrying it at the masthead, and may, instead of the colored lights above mentioned, have at hand, ready for use, a lantern with a green glass on the one side and a red glass on the other, to be used as prescribed above.

Pilot-vessels when not engaged on their station on pilotage duty shall carry lights similar to those of other vessels of their tonnage.

A steam pilot-vessel, when engaged on her station on pilotage duty and in waters of the United States, and not at anchor, shall, in addition to the lights required for all pilot-boats,

carry at a distance of eight feet below her white masthead light a red light, visible all around the horizon and of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles, and also the colored lights required to be carried by vessels when under way.

When engaged on her station on pilotage duty and in waters of the United States, and at anchor, she shall carry in addition to the lights required for all pilot boats the red light above mentioned, but not the colored side lights.

When not engaged on her station on pilotage duty, she shall carry the same lights as other steam vessels.

LIGHTS, ETC., OF FISHING VESSELS.

ART. 9. [*Article 9, act of August 19, 1890, was repealed by act of May 28, 1894, and article 10, act of March 3, 1885, was reenacted in part by act of August 13, 1894, and is reproduced here in part as article 9. It will be the object of further consideration by the maritime powers:*]

Fishing-vessels of less than twenty tons net registered tonnage, when under way and when not having their nets, trawls, dredges, or lines in the water, shall not be obliged to carry the colored side-lights; but every such vessel shall in lieu thereof have ready at hand a lantern with a green glass on the one side and a red glass on the other side, and on approaching to or being approached by another vessel such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

The following portion of this article applies only to fishing-vessels and boats when in the sea off the coast of Europe lying north of Cape Finisterre:

(*a*) All fishing-vessels and fishing-boats of twenty tons net registered tonnage or upward, when under way and when not having their nets, trawls, dredges, or lines in the water, shall carry and show the same lights as other vessels under way.

(*b*) All vessels when engaged in fishing with drift nets shall exhibit two white lights from any part of the vessel where they can be best seen. Such lights shall be placed so that the vertical distance between them shall be not less than six feet and not more than ten feet, and so that the horizontal distance between them, measured in a line with the keel of the vessel, shall be not less than five feet and not more than ten feet. The lower of these two lights shall be the more forward, and both of them shall be of such a character and contained in lanterns of such construction as to show all around the horizon, on a dark night, with a clear atmosphere, for a distance of not less than three miles.

(*c*) All vessels when trawling, dredging, or fishing with any kind of drag-nets shall exhibit, from some part of the vessel where they can be best seen, two lights. One of these lights shall be red and the other shall be white. The red light shall be above the white light, and shall be at a vertical distance from it of not less than six feet and not more than twelve feet; and the horizontal distance between them, if any, shall not be more than ten feet. These two lights shall be of such a character and contained in lanterns of such construction as to be visible all around the horizon, on a dark night, with a clear atmosphere, the white light to a distance of not less than three miles and the red light of not less than two miles.

(*d*) A vessel employed in line-fishing, with her lines out, shall carry the same lights as a vessel when engaged in fishing with drift nets.

(*e*) If a vessel, when fishing with a trawl, dredge, or any kind of drag-net, becomes stationary in consequence of her gear getting fast to a rock or other obstruction, she shall show the light and make the fog signal for a vessel at anchor.

(*f*) Fishing-vessels may at any time use a flare-up in addition to the lights which they are by this article required to carry and show. All flare-up lights exhibited by a vessel when trawling, dredging, or fishing with any kind of drag-net shall be shown at the after-part of the vessel, excepting that if the vessel is hanging by the stern to her trawl, dredge, or drag-net they shall be exhibited from the bow.

(*g*) Every fishing-vessel when at anchor between sunset and sunrise shall exhibit a white light, visible all around the horizon at a distance of at least one mile.

(*h*) In a fog a drift-net vessel attached to her nets, and a vessel when trawling, dredging, or fishing with any kind of drag-net, and a vessel employed in line-fishing with her lines out, shall, at intervals of not more than two minutes, make a blast with her fog horn and ring her bell alternately.

LIGHTS FOR AN OVERTAKEN VESSEL.

ART. 10. A vessel which is being overtaken by another shall show from her stern to such last-mentioned vessel a white light or a flare-up light.

The white light required to be shown by this article may be fixed and carried in a lantern, but in such case the lantern shall be so constructed, fitted, and screened that it shall throw an unbroken light over an arc of the horizon of twelve points of the compass, namely,

for six points from right aft on each side of the vessel, so as to be visible at a distance of at least one mile. Such light shall be carried as nearly as practicable on the same level as the side lights.

ANCHOR LIGHTS.

ART. 11. A vessel under one hundred and fifty feet in length, when at anchor, shall carry forward, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light in a lantern so constructed as to show a clear, uniform, and unbroken light visible all around the horizon at a distance of at least one mile.

A vessel of one hundred and fifty feet or upward in length, when at anchor, shall carry in the forward part of the vessel, at a height of not less than twenty and not exceeding forty feet above the hull, one such light, and at or near the stern of the vessel, and at such a height that it shall be not less than fifteen feet lower than the forward light, another such light.

The length of a vessel shall be deemed to be the length appearing in her certificate of registry.

A vessel aground in or near a fair-way shall carry the above light or lights and the two red lights prescribed by article four (*a*).

SPECIAL SIGNALS.

ART. 12. Every vessel may, if necessary in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that can not be mistaken for a distress signal.

NAVAL LIGHTS AND RECOGNITION SIGNALS.

ART. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal-lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorized by their respective Governments and duly registered and published.

STEAM VESSEL UNDER SAIL BY DAY.

ART. 14. A steam-vessel proceeding under sail only but having her funnel up, shall carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

III.—SOUND SIGNALS IN FOG, ETC.

PRELIMINARY.

ART. 15. All signals prescribed by this article for vessels under way shall be given:

First. By "steam-vessels" on the whistle or siren.

Second. By "sailing-vessels" and "vessels towed" on the fog horn.

The words "prolonged blast" used in this article shall mean a blast of from four to six seconds' duration.

A steam-vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn, to be sounded by mechanical means, and also with an efficient bell. (In all cases where the rules require a bell to be used, a drum may be substituted on board Turkish vessels, or a gong where such articles are used on board small seagoing vessels.) A sailing vessel of twenty tons gross tonnage or upward shall be provided with a similar fog horn and bell.

In fog, mist, falling snow, or heavy rain-storms, whether by day or night, the signals described in this article shall be used as follows, namely:

STEAM VESSEL UNDER WAY.

(*a*) A steam-vessel having way upon her shall sound, at intervals of not more than two minutes, a prolonged blast.

(*b*) A steam-vessel under way, but stopped, and having no way upon her, shall sound, at intervals of not more than two minutes, two prolonged blasts, with an interval of about one second between.

SAIL VESSEL UNDER WAY.

(*c*) A sailing vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack, one blast; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

VESSELS AT ANCHOR OR NOT UNDER WAY.

(*d*) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

VESSELS TOWING, ETC.

(*e*) A vessel when towing, a vessel employed in laying or picking up a telegraph cable, and a vessel under way, which is unable to get out of the way of an approaching vessel through being not under command, or unable to maneuver as required by the rules, shall, instead of the signals prescribed in subdivisions (*a*) and (*c*) of this article, at intervals of not more than two minutes, sound three blasts in succession, namely: One prolonged blast followed by short blasts. A vessel towed may give this signal and she shall not give any other.

SMALL SAILING VESSELS AND BOATS.

Sailing vessels and boats of less than twenty tons gross tonnage shall not be obliged to give the above-mentioned signals, but, if they do not, they shall make some other efficient sound signal at intervals of not more than one minute.

SPEED IN FOG.

ART. 16. Every vessel shall, in a fog, mist, falling snow, or heavy rain storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam-vessel hearing, apparently forward of her beam, the fog-signal of a vessel, the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

IV.—STEERING AND SAILING RULES.

PRELIMINARY.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SAILING VESSELS.

ART. 17. When two sailing-vessels are approaching one another, so as to invoke risk of collision, one of them shall keep out of the way of the other, as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(*b*) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the vessel which is to the windward shall keep out of the way of the vessel which is to the leeward.

(*e*) A vessel which has the wind aft shall keep out of the way of the other vessel.

STEAM VESSELS.

ART. 18. When two steam-vessels are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two vessels which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are when each of the two vessels is end on, or nearly end on, to the other; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own; and by night, to cases in which each vessel is in such a position as to see both the side-lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course; or by night, to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

TWO STEAM VESSELS CROSSING.

ART. 19. When two steam-vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

STEAM VESSEL SHALL KEEP OUT OF THE WAY OF SAILING VESSEL.

ART. 20. When a steam-vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, the steam vessel shall keep out of the way of the sailing vessel.

COURSE AND SPEED.

ART. 21. Where, by any of these rules, one of two vessels is to keep out of the way, the other shall keep her course and speed.

NOTE.—When in consequence of thick weather or other causes, such vessel finds herself so close that collision can not be avoided by the action of the giving-way vessel alone, she also shall take such action as will best aid to avert collision. (See articles twenty-seven and twenty-nine.)

CROSSING AHEAD.

ART. 22. Every vessel which is directed by these rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

STEAM VESSEL SHALL SLACKEN SPEED OR STOP.

ART. 23. Every steam-vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

OVERTAKING VESSELS.

ART. 24. Notwithstanding anything contained in these rules every vessel, overtaking any other, shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position, with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side-lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel can not always know with certainty whether she is forward of or abaft this direction from the other vessel, she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

NARROW CHANNELS.

ART. 25. In narrow channels every steam-vessel shall, when it is safe and practicable, keep to that side of the fair-way or mid-channel which lies on the starboard side of such vessel.

RIGHTS OF WAY OF FISHING VESSELS.

ART. 26. Sailing vessels under way shall keep out of the way of sailing vessels or boats fishing with nets, or lines, or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fair-way used by vessels other than fishing vessels or boats.

GENERAL PRUDENTIAL RULE.

ART. 27. In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

SOUND SIGNALS FOR PASSING STEAMERS.

ART. 28. The words "short blasts," used in this article, shall mean a blast of about one second's duration.

When vessels are in sight of one another, a steam-vessel under way, in taking any course authorized or required by these rules, shall indicate that course by the following signals on her whistle or siren, namely:

One short blast to mean, "I am directing my course to starboard."

Two short blasts to mean, "I am directing my course to port."

Three short blasts to mean, "My engines are going at full speed astern."

PRECAUTION.

ART. 29. Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

ART. 30. [See p. 229.]

DISTRESS SIGNALS.

ART. 31. When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

In the daytime—

First. A gun or other explosive signal fired at intervals of about a minute.

Second. The international code signal of distress indicated by N. C.

Third. The distance signal, consisting of a square flag, having either above or below it a ball or anything resembling a ball.

Fourth. A continuous sounding with any fog-signal apparatus.

At night—

First. A gun or other explosive signal fired at intervals of about a minute.

Second. Flames on the vessel (as from a burning tar barrel, oil barrel, and so forth).

Third. Rockets or shells throwing stars of any color or description, fired one at a time, at short intervals.

Fourth. A continuous sounding with any fog-signal apparatus.

INLAND RULES.

NOTE.—*The paragraphs indicated by a vertical line are identically the same as corresponding paragraphs in the International Rules.*

I.—ENACTING CLAUSE AND SCOPE.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following regulations for preventing collision shall be followed by all vessels navigating all harbors, rivers, and inland waters of the United States, except the Great Lakes and their connecting and tributary waters as far east as Montreal, and the Red River of the North and rivers emptying into the Gulf of Mexico and their tributaries, and are hereby declared special rules duly made by local authority:

ART. 30. The exhibition of any light on board of a vessel of war of the United States or a revenue cutter may be suspended whenever, in the opinion of the Secretary of the Navy, the commander in chief of a squadron, or the commander of a vessel acting singly, the special character of the service may require it.

PRELIMINARY DEFINITIONS.

In the following rules every steam-vessel which is under sail and not under steam is to be considered a sailing-vessel, and every vessel under steam, whether under sail or not, is to be considered a steam-vessel.

The word "steam-vessel" shall include any vessel propelled by machinery.

A vessel is "under way," within the meaning of these rules, when she is not at anchor, or made fast to the shore, or aground.

II.—LIGHTS AND SO FORTH.

The word "visible" in these rules, when applied to lights, shall mean visible on a dark night with a clear atmosphere.

ART. 1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

STEAM VESSELS—MASTHEAD LIGHT.

ART. 2. A steam-vessel when under way shall carry (*a*) on or in front of the foremast, or, if a vessel without a foremast, then in the forepart of the vessel, a bright white light so constructed as to show an unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side, and of such a character as to be visible at a distance of at least five miles.

STEAM VESSELS—SIDE LIGHTS.

(*b*) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least two miles.

(*c*) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible at a distance of at least two miles.

(*d*) The said green and red side-lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

STEAM VESSELS—RANGE LIGHTS.

(*e*) A sea-going steam-vessel when under way may carry an additional white light similar in construction to the light mentioned in subdivision (*a*). These two lights shall be so placed in line with the keel that one shall be at least fifteen feet higher than the other, and in such a position with reference to each other that the lower light shall be forward of the upper one. The vertical distance between these lights shall be less than the horizontal distance.

(*f*) All steam-vessels (except sea-going vessels and ferry-boats) shall carry in addition to green and red lights required by article two (*b*), (*c*), and screens as required by article two (*d*), a central range of two white lights; the after-light being carried at an elevation at least fifteen feet above the light at the head of the vessel. The head-light shall be so constructed as to show an unbroken light through twenty points of the compass, namely, from right ahead to two points abaft the beam on either side of the vessel, and the after-light so as to show all around the horizon.

STEAM VESSELS WHEN TOWING.

ART. 3. A steam-vessel when towing another vessel shall, in addition to her side-lights, carry two bright white lights in a vertical line one over the other, not less than three feet apart, and when towing more than one vessel shall carry an additional bright white light three feet above or below such lights, if the length of the tow, measuring from the stern of the towing vessel to the stern of the last vessel towed, exceed six hundred feet. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in article two (*a*) or the after range light mentioned in article two (*f*).

Such steam-vessels may carry a small white light abaft the funnel or aftermast for the vessel towed to steer by, but such light shall not be visible forward of the beam.

LIGHTS FOR SAILING VESSELS AND VESSELS IN TOW.

ART. 5. A sailing-vessel under way or being towed shall carry the same lights as are prescribed by article two for a steam-vessel under way, with the exception of the white lights mentioned therein, which they shall never carry.

LIGHTS FOR SMALL VESSELS.

ART. 6. Whenever, as in the case of vessels of less than ten gross tons under way during bad weather, the green and red side-lights can not be fixed, these lights shall be kept at

hand, lighted and ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable, more than two points abaft the beam on their respective sides. To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

LIGHTS FOR ROWING BOATS.

ART. 7. Rowing boats, whether under oars or sail, shall have ready at hand a lantern showing a white light which shall be temporarily exhibited in sufficient time to prevent collision.

LIGHTS FOR PILOT VESSELS.

ART. 8. Pilot-vessels, when engaged on their station on pilotage duty, shall not show the lights required for other vessels, but shall carry a white light at the masthead, visible all around the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals which shall never exceed fifteen minutes.

On the near approach of or to other vessels they shall have their side-lights lighted, ready for use, and shall flash or show them at short intervals to indicate the direction in which they are heading, but the green light shall not be shown on the port side nor the red light on the starboard side.

A pilot-vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board may show the white light instead of carrying it at the masthead, and may, instead of the colored lights above mentioned, have at hand ready for use, a lantern with a green glass on the one side and a red glass on the other, to be used as prescribed above.

Pilot vessels, when not engaged on their station on pilotage duty, shall carry lights similar to those of other vessels of their tonnage.

A steam pilot vessel, when engaged on her station on pilotage duty and in waters of the United States, and not at anchor, shall, in addition to the lights required for all pilot boats, carry at a distance of eight feet below her white masthead light a red light, visible all around the horizon and of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles, and also the colored lights required to be carried by vessels when under way.

When engaged on her station on pilotage duty and in waters of the United States, and at anchor, she shall carry, in addition to the lights required for all pilot boats, the red light above mentioned, but not the colored side lights.

When not engaged on her station on pilotage duty, she shall carry the same lights as other steam-vessels.

LIGHTS, ETC., OF FISHING VESSELS.

ART. 9. (*a*) Fishing-vessels of less than ten gross tons, when under way and when not having their nets, trawls, dredges, or lines in the water, shall not be obliged to carry the colored side-lights; but every such vessel shall, in lieu thereof, have ready at hand a lantern with a green glass on one side and a red glass on the other side, and on approaching to or being approached by another vessel such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

(*b*) All fishing-vessels and fishing-boats of ten gross tons or upward, when under way and when not having their nets, trawls, dredges, or lines in the water, shall carry and show the same lights as other vessels under way.

(*c*) All vessels, when trawling, dredging, or fishing with any kind of drag-nets or lines, shall exhibit, from some part of the vessel where they can be best seen, two lights. One of these lights shall be red and the other shall be white. The red light shall be above the white light, and shall be at a vertical distance from it of not less than six feet and not more than twelve feet; and the horizontal distance between them, if any, shall not be more than ten feet. These two lights shall be of such a character and contained in lanterns of such construction as to be visible all around the horizon, the white light a distance of not less than three miles and the red light of not less than two miles.

LIGHTS FOR RAFTS OR OTHER WATER CRAFT.

(*d*) Rafts, or other water craft not herein provided for, navigating by hand power, horse power, or by the current of the river, shall carry one or more good white lights,

which shall be placed in such manner as shall be prescribed by the Board of Supervising Inspectors of Steam Vessels.*

LIGHTS FOR AN OVERTAKEN VESSEL.

ART. 10. A vessel which is being overtaken by another, except a steam-vessel with an after range-light showing all around the horizon, shall show from her stern to such last-mentioned vessel a white light or a flare-up light.

ANCHOR LIGHTS.

ART. 11. A vessel under one hundred and fifty feet in length when at anchor shall carry forward, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light, in a lantern so constructed as to show a clear, uniform, and unbroken light visible all around the horizon at a distance of at least one mile.

A vessel of one hundred and fifty feet or upward in length when at anchor shall carry in the forward part of the vessel, at a height of not less than twenty and not exceeding forty feet above the hull, one such light; and at or near the stern of the vessel, and at such a height that it shall be not less than fifteen feet lower than the forward light, another such light.

The length of a vessel shall be deemed to be the length appearing in her certificate of registry.

SPECIAL SIGNALS.

ART. 12. Every vessel may, if necessary, in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that can not be mistaken for a distress signal.

NAVAL LIGHTS AND RECOGNITION SIGNALS.

ART. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorized by their respective Governments, and duly authorized and published.

STEAM VESSELS UNDER SAIL BY DAY.

ART. 14. A steam vessel proceeding under sail only, but having her funnel up, may carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

III.—SOUND SIGNALS IN FOG, ETC.

PRELIMINARY.

ART. 15. All signals prescribed by this article for vessels under way shall be given:

1. By "steam-vessels" on the whistle or siren.
2. By "sailing-vessels" and "vessels towed" on the fog horn.

The words "prolonged blast" used in this article shall mean a blast of from four to six seconds' duration.

A steam-vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn; also with an efficient bell. A sailing-vessel of twenty tons gross tonnage or upward shall be provided with a similar fog horn and bell.

**Resolved*, That all coal boats, trading-boats, produce boats, canal boats, oyster boats, fishing boats, and other water craft navigating any bay, harbor, or river, propelled by hand power, horse power, sail, or by the current of the river, or which shall be moored in or near the channel or fairway of any bay, harbor, or river, shall carry one bright white light forward, not less than 6 feet above the rail or deck.

Rafts of one crib and not more than two in length shall carry one bright white light on a pole not less than twelve feet high; three or more cribs in length, shall carry one white light at each end of the raft at the same height. Boom rafts with cross binders towed ahead of steamers on the Mississippi and Ohio rivers, and other waters flowing into the Gulf of Mexico, and on the Red River of the North, shall carry a white light *twelve feet high* at the forward end of the raft, and one such light at each side midway between the forward and after end.

Rafts of more than one crib abreast shall carry one white light on each outside corner of the raft, making four lights in all. Bag or boom rafts navigating or anchored in the fairway of any bay, harbor, or river shall carry a white light at least twelve feet high at each end of the raft, and one of such lights on each side midway between the forward and after end.

Rowboats shall carry one white light two feet above the stem.

JAS. A. DUMONT,
Supervising Inspector General,
President Board of Supervising Inspectors.

Approved, February 16, 1891.

A. B. NETTLETON,
Acting Secretary.

In fog, mist, falling snow, or heavy rain-storms, whether by day or night, the signals described in this article shall be used as follows, namely:

STEAM VESSEL UNDER WAY.

(*a*) A steam-vessel under way shall sound, at intervals of not more than one minute, a prolonged blast.

SAIL VESSEL UNDER WAY.

(*c*) A sailing-vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack, one blast; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

VESSELS AT ANCHOR OR NOT UNDER WAY.

(*d*) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

VESSELS TOWING, ETC.

(*e*) A steam-vessel when towing shall, instead of the signals prescribed in subdivision (*a*) of this article, at intervals of not more than one minute, sound three blasts in succession, namely, one prolonged blast followed by two short blasts. A vessel towed may give this signal and she shall not give any other.

RAFTS OR OTHER WATER CRAFT.

(*f*) All rafts or other water craft, not herein provided for, navigating by hand power, horse power, or by the current of the river, shall sound a blast of the fog horn, or equivalent signal, at intervals of not more than one minute.

SPEED IN FOG.

ART. 16. Every vessel shall, in a fog, mist, falling snow, or heavy rain-storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam-vessel hearing, apparently forward of her beam, the fog-signal of a vessel, the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

IV.—STEERING AND SAILING RULES.

PRELIMINARY.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SAILING VESSELS.

ART. 17. When two sailing vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is closed-hauled.

(*b*) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the vessel which is to the windward shall keep out of the way of the vessel which is to the leeward.

(*e*) A vessel which has the wind aft shall keep out of the way of the other vessel.

STEAM VESSELS.

ART. 18. RULE I. When steam-vessels are approaching each other head and head, that is, end on, or nearly so, it shall be the duty of each to pass on the port side of the other; and either vessel shall give, as a signal of her intention, one short and distinct blast of her

whistle, which the other vessel shall answer promptly by a similar blast of her whistle, and thereupon such vessels shall pass on the port side of each other. But if the courses of such vessels are so far on the starboard of each other as not to be considered as meeting head and head, either vessel shall immediately give two short and distinct blasts of her whistle, which the other vessel shall answer promptly by two similar blasts of her whistle, and they shall pass on the starboard side of each other.

The foregoing only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own, and by night to cases in which each vessel is in such a position as to see both the side-lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course, or by night to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light or a green light without a red light is seen ahead, or where both green and red lights are seen anywhere but ahead.

RULE III. If, when steam-vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam-whistle.

RULE V. Whenever a steam-vessel is nearing a short bend or curve in the channel, where, from the height of the banks or other cause, a steam-vessel approaching from the opposite direction can not be seen for a distance of half a mile, such steam-vessel, when she shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam-whistle, which signal shall be answered by a similar blast, given by any approaching steam-vessel that may be within hearing. Should such signal be so answered by a steam-vessel upon the further side of such bend, then the usual signals for meeting and passing shall immediately be given and answered; but, if the first alarm signal of such vessel be not answered, she is to consider the channel clear and govern herself accordingly.

When steam-vessels are moved from their docks or berths, and other boats are liable to pass from any direction toward them, they shall give the same signal as in the case of vessels meeting at a bend, but immediately after clearing the berths so as to be fully in sight they shall be governed by the steering and sailing rules.

RULE VIII. When steam-vessels are running in the same direction, and the vessel which is astern shall desire to pass on the right or starboard hand of the vessel ahead, she shall give one short blast of the steam-whistle, as a signal of such desire, and if the vessel ahead answers with one blast, she shall put her helm to port; or if she shall desire to pass on the left or port side of the vessel ahead, she shall give two short blasts of the steam-whistle as a signal of such desire, and if the vessel ahead answers with two blasts, shall put her helm to starboard; or if the vessel ahead does not think it safe for the vessel astern to attempt to pass at that point, she shall immediately signify the same by giving several short and rapid blasts of the steam-whistle, not less than four, and under no circumstances shall the vessel astern attempt to pass the vessel ahead until such time as they have reached a point where it can be safely done, when said vessel ahead shall signify her willingness by blowing the proper signals. The vessel ahead shall in no case attempt to cross the bow or crowd upon the course of the passing vessel.

RULE IX. The whistle signals provided in the rules under this article for steam-vessels meeting, passing, or overtaking, are never to be used except when steamers are in sight of each other, and the course and position of each can be determined in the daytime by a sight of the vessel itself, or by night by seeing its signal lights. In fog, mist, falling snow, or heavy rain-storms, when vessels can not so see each other, fog-signals only must be given.

TWO STEAM VESSELS CROSSING.

ART. 19. When two steam-vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

STEAM VESSEL SHALL KEEP OUT OF THE WAY OF SAILING VESSELS.

ART. 20. When a steam-vessel and a sailing-vessel are proceeding in such directions as to involve risk of collision, the steam-vessel shall keep out of the way of the sailing-vessel.

COURSE AND SPEED.

ART. 21. Where, by any of these rules, one of the two vessels is to keep out of the way, the other shall keep her course and speed.

CROSSING AHEAD.

ART. 22. Every vessel which is directed by the rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

STEAM VESSEL SHALL SLACKEN SPEED OR STOP.

ART. 23. Every steam-vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

OVERTAKING VESSELS.

ART. 24. Notwithstanding anything contained in these rules, every vessel overtaking any other shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side-lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel can not always know with certainty whether she is forward of or abaft this direction from the other vessel she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

NARROW CHANNELS.

ART. 25. In narrow channels every steam-vessel shall, when it is safe and practicable, keep to that side of the fair-way or mid-channel which lies on the starboard side of such vessel.

RIGHTS OF WAY OF FISHING VESSELS.

ART. 26. Sailing-vessels under way shall keep out of the way of sailing-vessels or boats fishing with nets, or lines, or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fair-way used by vessels other than fishing-vessels or boats.

GENERAL PRUDENTIAL RULE.

ART. 27. In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

SOUND SIGNALS FOR VESSELS IN SIGHT OF ONE ANOTHER.

ART. 28. When vessels are in sight of one another a steam-vessel under way whose engines are going at full speed astern shall indicate that fact by three short blasts on the whistle.

PRECAUTION.

ART. 29. Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

ART. 30. [See page 236.]

DISTRESS SIGNALS.

ART. 31. When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

In the daytime—

A continuous sounding with any fog-signal apparatus, or firing a gun.

At night—

First. Flames on the vessel, as from a burning tar barrel, oil barrel, and so forth.

Second. A continuous sounding with any fog-signal apparatus, or firing a gun.

ADDITIONAL RULES.

SEC. 2. That the supervising inspectors of steam-vessels and the Supervising Inspector-General shall establish such rules to be observed by steam-vessels in passing each other and as to the lights to be carried by ferry-boats and by barges and canal-boats when in tow of steam-vessels, not inconsistent with the provisions of this Act, as they from time to time may deem necessary for safety, which rules when approved by the Secretary of the Treasury, are hereby declared special rules duly made by local authority, as provided for in article thirty of chapter eight hundred and two of the laws of eighteen hundred and ninety. Two printed copies of such rules shall be furnished to such ferry-boats and steam-vessels, which rules shall be kept posted up in conspicuous places in such vessels.

PENALTY.

SEC. 3. That every pilot, engineer, mate, or master of any steam-vessel, and every master or mate of any barge or canal-boat, who neglects or refuses to observe the provisions of this Act, or the regulations established in pursuance of the preceding section, shall be liable to a penalty of fifty dollars, and for all damages sustained by any passenger in his person or baggage by such neglect or refusal: *Provided*, That nothing herein shall relieve any vessel, owner, or corporation from any liability incurred by reason of such neglect or refusal.

SEC. 4. That every vessel that shall be navigated without complying with the provisions of this Act shall be liable to a penalty of two hundred dollars, one-half to go to the informer, for which sum the vessel so navigated shall be liable, and may be seized and proceeded against by action in any district court of the United States having jurisdiction of the offense.

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DEPARTMENT OF COMMERCE AND LABOR,
COAST AND GEODETIC SURVEY,
WASHINGTON, D. C., *August 1, 1903.*

This volume covers the coast from Cape Ann to Point Judith, including the harbors and navigable inland passages.

This publication is based mainly upon the work of the Coast and Geodetic Survey, including the results of special examinations and investigations carried on in 1902 in connection with its preparation.

The system adopted in this publication includes—

I. A tabular description of all lighthouses, light-vessels, and fog signals; lists of life-saving stations, Weather Bureau storm warning display stations, and information regarding tides, tidal currents, variation of the compass, etc.

II. General information concerning the several bodies of water and harbors, including notes relative to pilots and pilotage, towboats, depth of water, draft of vessels entering, harbor and quarantine regulations, supplies, facilities for making repairs, usual or best anchorages, and other matters of practical interest. In each case the information of this nature precedes the sailing directions and is printed in smaller type.

III. Sailing directions, with subordinate paragraphs treating of prominent objects, dangers, aids to navigation, etc. In the arrangement adopted the aim has been to conform, as far as practicable, to the order in which these matters would be considered in practice, and to render available such information as may be wanted promptly. For this purpose, and to afford a ready means of reference from one part to another, the sailing directions, where long, are divided into numbered or lettered sections, printed in large type, each followed by its own subordinate remarks in smaller type.

IV. Appendices.

The first edition of this volume was prepared by Lieut. Edwin H. Tillman, U. S. N., assisted by Mr. John Ross. In the present (second) edition the text has been revised and brought up to date by Mr. John Ross and Mr. Herbert C. Graves, under the direction of Herbert G. Ogden, Assistant, Coast and Geodetic Survey, Inspector of Hydrography and Topography.

Great courtesy has been shown by local authorities in furnishing information desired for incorporation in this work.

The aids to navigation are correct to August 1, 1903.

As absolute accuracy in a work of this class is scarcely possible, navigators will confer a favor by notifying the Superintendent of the Coast and Geodetic Survey of errors which they may discover, or of additional matter which they think, for the good of mariners, should be inserted.

O. H. TITTMANN,
Superintendent.

NOTE.

All bearings and courses are *magnetic.*

All distances and current velocities are in *nautical miles*, except where otherwise stated.

Except where otherwise stated, all depths are at *mean low water.*

In winter when whistling buoys, bell buoys, lighted buoys, can buoys, and nun buoys are in danger of being carried away by ice, they are taken up and replaced by spar or spar-shaped buoys.

All charts referred to in this volume are published by the Coast and Geodetic Survey and can be obtained at the agencies, a list of which is found on pages 7–8.

SYSTEM OF BUOYAGE ADOPTED IN UNITED STATES WATERS.

The following order is observed in coloring and numbering the buoys in United States waters, viz:

1. In approaching the channel, etc., from seaward, RED BUOYS, with EVEN NUMBERS, will be found on the STARBOARD side of the channel, and must be left on the STARBOARD hand in passing in.

2. In approaching the channel, etc., from seaward, BLACK BUOYS, with ODD NUMBERS, will be found on the PORT side of the channel, and must be left on the PORT hand in passing in.

3. BUOYS painted with RED and BLACK HORIZONTAL STRIPES will be found on OBSTRUCTIONS, with channel ways on either side of them, and may be left on either hand in passing in.

4. BUOYS painted with WHITE and BLACK PERPENDICULAR STRIPES will be found in MID-CHANNEL and must be passed close-to to avoid danger.

All other distinguishing marks to buoys will be in addition to the foregoing, and may be employed to mark particular spots, *a description of which will be given in the printed list of buoys.*

Perches, with balls, cages, etc., will, when placed on buoys, be at turning points, the color and number indicating on what side they shall be passed.

Nun buoys, properly colored and numbered, are usually placed on the starboard side, and can buoys on the port side of channels.

Day beacons, stakes, and spindles (except such as are on the sides of channels, which will be colored like buoys) are constructed and distinguished with special reference to each locality, and particularly in regard to the background upon which they are projected.

Wherever practicable, the towers, beacons, buoys, spindles, and all other aids to navigation, are arranged in the buoy list in regular order *as they are passed by vessels entering from sea.*

The positions of the buoys mentioned in this volume are shown on the charts of the Coast and Geodetic Survey, which are kept corrected from information furnished by the Inspectors of the Lighthouse Districts, for the changes in the aids to navigation rendered necessary from time to time to indicate the best channels.

The following symbols and abbreviations are used on the charts of the Coast and Geodetic Survey:

◊ Red buoys, with even numbers, to be left on starboard hand in entering; if green, yellow, or white, the color is printed close to the buoy.

♦ Black buoys, with odd numbers, to be left on the port hand in entering.

◊ Black and white perpendicular stripes, without numbers, mid-channel or fairway buoys.

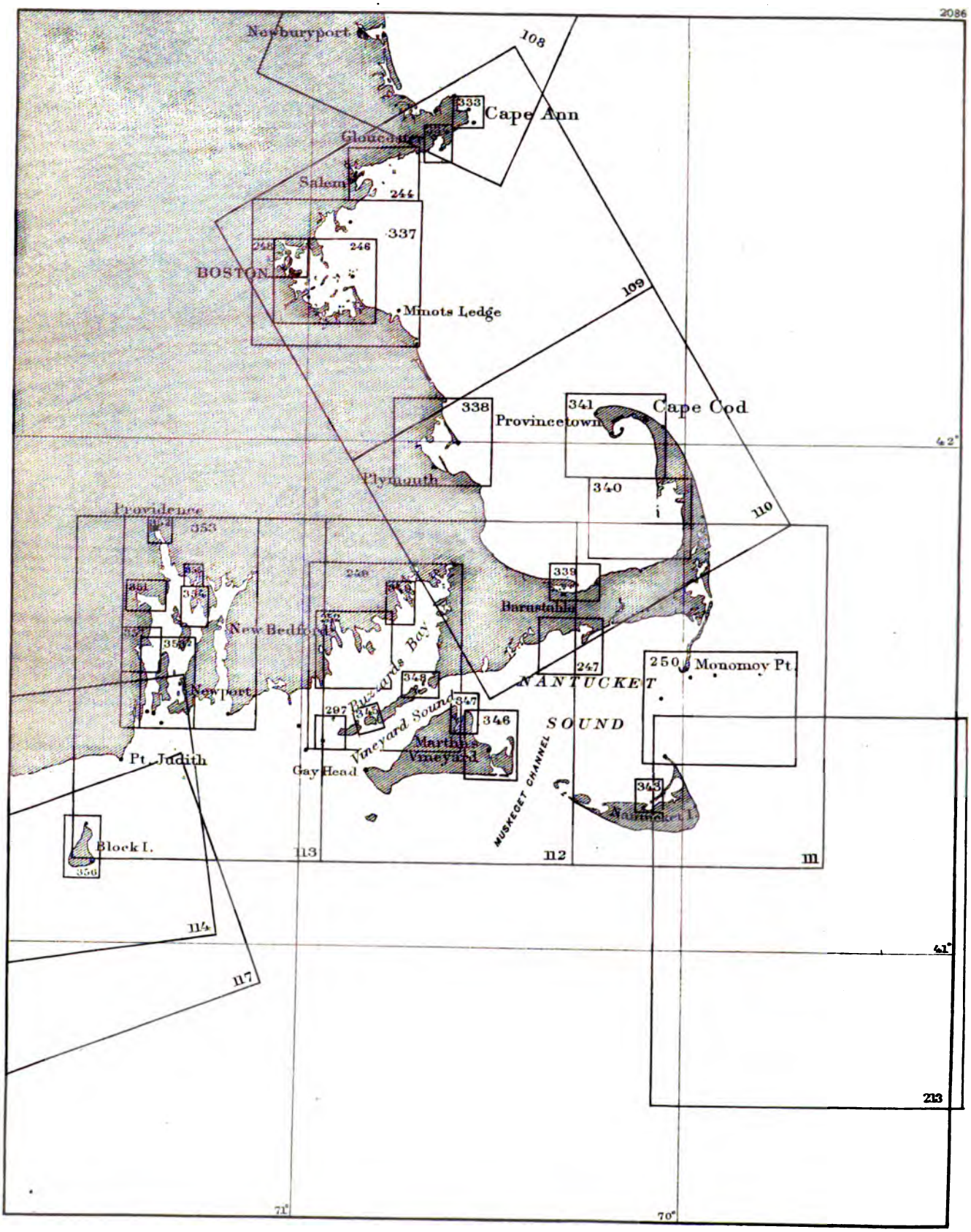
◊ or H. S., red and black horizontal stripes, without numbers, marking dangers or obstructions, to be left on either hand.

◊ Lighted buoys, different colors as above.

◊ ***WHISTLE,*** whistling buoys, different colors as above.

◊ ***BELL,*** bell buoys, different colors as above.

C., N., or S., signifies can, nun, or spar buoy.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UNITED STATES COAST PILOT.

ATLANTIC COAST—PART III.

FROM CAPE ANN TO POINT JUDITH.*

GENERAL REMARKS.

north of Nanset Beacons, are unmistakable marks when sighted from seaward. The lighthouses form the guides in approaching or running along the coast; at night, it is easy to pick up one light before losing another.

Harbors and anchorages.—The most important harbors are Gloucester, Salem, Boston, Provincetown, Vineyard Haven, New Bedford, Newport, and Providence. These and a number of harbors and anchorages of lesser importance are described under the different headings.

Aids to navigation are numerous, the harbor entrances and most prominent points being marked by lighthouses, and the principal dangers by buoys, beacons, or spindles; light-vessels are in position to mark some of the most frequented and difficult channels. The buoyage accords with the system adopted for United States waters. See page 5, and also the table of lighthouses on pages 12–21.

Pilots.—There are licensed pilots for the ports in the States of Massachusetts and Rhode Island; only certain classes of vessels are exempt from the payment of pilotage. For pilotage laws and rates of pilotage see "Pilot Laws" for States of Massachusetts and Rhode Island in Appendix II.

*These waters fall within the limits of the following charts: **1,000**, Sailing Chart, Mercator projection, Deg. Lat. = 3.7 inches; **51**, General Chart of the coast, Mercator projection, Deg. Lat. = 21.4 inches; **7**, General chart of the coast, scale $\frac{1}{400,000}$; **109, 110, 111, 112, 113**, scale $\frac{1}{80,000}$, price of each, $0.50; and a number of harbor charts, on a larger scale, as noted under the several headings; all charts referred to in footnotes are issued by the Coast and Geodetic Survey.

Coast and Geodetic Survey charts can be obtained from the agents named in the list given on pages 7–8. Facing page 7 is an index map, showing the location and limits of charts covering that part of the coast included in this volume. The catalogue of charts and other publications of the Survey also contain similar index maps; copies of this catalogue can be obtained free of charge on personal application at any of the sale agencies or by letter addressed to the Coast and Geodetic Survey Office, Washington, D. C.

Towboats are generally used by the larger sailing vessels when entering the harbors of Gloucester, Lynn, Boston, New Bedford, and Providence. Sailing vessels in ballast between New York and Boston sometimes employ a towboat for the whole distance, being towed through Nantucket and Vineyard sounds. See also "Towboats" under the different headings.

Harbor control.—Harbor masters are appointed for the harbors in the States of Massachusetts and Rhode Island, and they have charge of the anchorage and berthing of vessels in their respective harbors. For harbor regulations see Appendix II.

Lines within which the Inland Rules of the Road apply.—*Boston Harbor.*—From Point Allerton, **NNE.** ¼ **E.**, easterly, through Point Allerton Beacon to Northeast Grave Whistling Buoy; thence **NNE.** ¼ **E.** to Outer Breaker (Great Pig Rocks) Bell Buoy; thence **NE.** by **E.** ⅜ **E.** to Halfway Rock Beacon; thence **NE.** by **E.** ¼ **E.** to Eastern Point Lighthouse.

All Harbors in Cape Cod Bay, Mass.—A line drawn from Plymouth (Gurnet) Lighthouses **E.**, 16¼ miles, to Race Point Lighthouse.

Nantucket Sound, Vineyard Sound, Buzzards Bay, Narragansett Bay, Block Island Sound, and Easterly Entrance to Long Island Sound.—A line drawn from Chatham Lighthouses, Mass., **S.** by **E.** ⅜ **E.**, about 6 miles, to Northeast Slue Channel Whistling Buoy (Pollock Rip); thence **S.** by **W.** ⅝ **W.**, about 11 miles, to Great Round Shoal Light-vessel; thence **SSW.** ⅜ **W.**, 7⅝ miles, to Sankaty Head Lighthouse; from the westerly end of Tuckernuck Island **NW.** by **W.** ½ **W.**, about 5¼ miles, to Wasque Point, Chappaquiddick Island; from Gay Head Lighthouse **W.** ¾ **S.**, 35 miles, to Block Island (**SE.**) Lighthouse; thence **W.** ¾ **S.**, 15 miles, to Montauk Point Lighthouse, on the easterly end of Long Island, N. Y.

Rules of the Road.—The international and inland Rules of the Road are given in Appendix V.

Quarantine.—The quarantine laws of the States of Massachusetts and Rhode Island govern the ports of those States. Local municipal officers have the power to make quarantine regulations for the ports under their control. See "Quarantine," Appendix II and Appendix IV.

Storm warning displays.—A table of the storm warning display stations of the United States Weather Bureau is given on page 24, and an explanation of the displays is given in Appendix III.

Marine Hospital.—There is a United States Marine Hospital at Chelsea (near Boston), and at Vineyard Haven, Mass. There are relief stations of Class III of the United States Public-Health and Marine-Hospital Service at Gloucester and New Bedford, Mass., and Newport and Providence, R. I.; and emergency relief stations of Class IV at Barnstable, Chatham, Dennis, Edgartown, Hyannis, Provincetown, and Salem, Mass.

Supplies.—Coal can be had at Boston, New Bedford, Newport, Fall River, and Providence, and a limited supply may be had at Gloucester, Salem, Provincetown, and Hyannis. Water, provisions, and some ship-chandler's stores can be obtained at the above places and at many of the smaller cities and towns. A complete line of ship's supplies can be obtained at Boston.

Repairs.—There are docking facilities at Boston, New Bedford, and Providence, where also repairs can be made to the machinery of steamers. Sailing vessels and steamers of large size can be docked only at Boston. See "Repairs" under the headings, Boston, New Bedford, and Providence.

The prevailing winds in summer are southwesterly and in winter northerly.

Fogs are liable to occur at any season, but are more frequent from April to October than at any other time during the year. They are usually brought by easterly and southerly winds and occasionally by southwesterly winds. Westerly and northerly winds clear away the fog.

Ice.—In severe winters some of the harbors are closed to navigation by ice, and there is more or less drift ice in all the harbors, in Cape Cod Bay, on Monomoy and Nantucket shoals, and in Nantucket and Vineyard sounds. In the principal harbors steamers and tugs usually keep a channel open. See "Ice" under the different headings.

TIDES.*

GENERAL TABLE.

Locality.	Lunitidal Intervals.† High water.		Lunitidal Intervals.† Low water.		Correction for standard time.	Rise and Fall (Range). Mean tides.	Rise and Fall (Range). Spring tides.	Rise and Fall (Range). Neap tides.	Rise of highest tide observed.
	h.	m.	h.	m.	m.	Feet.	Feet.	Feet.	Feet.
Gloucester Harbor	11	02	4	49	−17	8.9	10.2	7.5	13.1
Salem Harbor	11	16	5	03	−16	9.2	10.6	7.7	13.3
Boston, Navy Yard	11	27	5	17	−16	9.6	11.0	8.1	13.8
Boston Lighthouse	11	09	4	56	−16	9.5	10.9	8.0	13.6
Plymouth Harbor	11	19	5	08	−17	10.2	11.7	8.6	14.6
Barnstable Harbor	11	36	5	25	−19	10.1	11.6	8.5	14.5
Provincetown Harbor	11	29	5	17	−19	9.2	10.6	7.7	13.3
Monomoy Point	12	00	5	38	−20	3.7	4.3	3.1	5.5
Nantucket (Great Point) Lighthouse	12	10	5	40	−20	3.0	3.7	2.2	4.6
Chatham Roads	0	06	6	04	−20	3.5	4.3	2.6	5.2
Nantucket Harbor	0	04	6	00	−20	3.1	3.8	2.3	4.7
Hyannis Harbor	12	23	5	35	−19	3.1	3.8	2.3	4.7
Edgartown Harbor	12	16	5	21	−18	2.0	2.4	1.5	3.0
Vineyard Haven Harbor	11	43	5	03	−18	1.7	2.1	1.2	2.7
Woods Hole	8	36	2	09	−17	1.7	2.1	1.2	2.7
Quicks Hole, south side	7	38	1	29	−17	3.1	3.8	2.3	4.7
Gay Head Lighthouse	7	31	1	20	−17	3.0	3.7	2.2	4.6
Cuttyhunk Lighthouse	7	36	0	59	−16	3.5	4.3	2.6	5.2
New Bedford Harbor	7	57	1	18	−16	4.2	5.2	3.1	6.3
Bird Island Lighthouse	7	55	0	59	−17	4.3	5.3	3.1	6.5
Beavertail Lighthouse	7	40	1	09	−14	3.8	4.7	2.8	5.7
Newport Harbor	7	48	1	00	−15	3.5	4.4	2.6	5.3
Fall River Harbor	8	10	0	51	−15	4.9	5.8	4.0	7.0
Providence Harbor	8	12	0	57	−14	4.4	5.4	3.4	6.6

* Tide tables for the Atlantic coast of the United States, published annually by the Coast and Geodetic Survey, predicting the times and heights of tides for every day of the year, at all the principal ports, can be obtained from the agents named in the list given on pages 7–8; price $0.15.

† The mean lunitidal interval for high water or for low water is the average time from the meridian transit of the moon to the next following high or low water, respectively; it is also called the corrected establishment.

VARIATION OF THE COMPASS.

The magnetic variations for 1903, and annual increase at points mentioned, are as follows:

Locality.	Variation.	Annual increase.
	°	′
Cape Ann whistling buoy	13½ W.	2
Bakers Island Lighthouse, Salem Entrance	13	2
Boston Light-vessel	13	2
Cape Cod Bay	12¾	2
Off Nanset Lighthouses	13	2
Handkerchief Light-vessel, Nantucket Sound	12½	2
Nantucket Shoals Light-vessel	12	2
Cape Poge	12	2
Gay Head	11¾	2
Hen and Chickens Light-vessel, Buzzards Bay	12	2
Brenton Reef Light-vessel, Narragansett Bay Entrance	11¾	2
Off Bristol, R. I	12	2

TABLE OF LIGHTS.

Lighthouse Districts, Etc.—The coast and the waters covered by this volume lie within the **Second and Third Lighthouse Districts** of the United States. These districts extend from Hampton, New Hampshire, to a point on the coast opposite Shrewsbury Rocks, New Jersey. The Light list for the Atlantic and Gulf coasts of the United States and the Buoy lists for the Second and Third Districts give full descriptions of the aids to navigation.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
		° ′ ″				
1	CAPE ANN (N.)	42 38 21 70 34 31	Fixed white	1	161¾	19
2	CAPE ANN (S.)	42 38 13 70 34 32	Fixed white	1	165½	19
3	Eastern Point	42 34 (49) 70 39 (54)	Flashing red every 5 seconds	4	56½	13
4	Dog Bar Breakwater Beacon	42 34 (56) 70 40 (16)				
5	Tenpound Island	42 36 07 70 39 58	Flashing white every 5 seconds	6	43½	12
	SALEM HARBOR:					
6	Baker Island	42 32 12 70 47 11	Fixed white	4	111	16¼
7	Baker Island Beacon		Fixed white	4	91¼	15¼
8	Hospital Point	42 32 48 70 51 23	Fixed white	3½	69¾	13¾
9	Fort Pickering	42 31 36 70 52 01	Fixed white	6	28¼	10½
10	Derby Wharf	42 31 00 70 53 03	Fixed red	6	22	7½
11	Marblehead	42 30 (20) 70 50 (03)	Fixed white	6	130	11¼
12	Egg Rock	42 26 01 70 53 54	Fixed red	5	90	8½
	LYNN HARBOR:					
13	White Rocks	42 25 (35) 70 57 (15)	Fixed red Fixed white	Post lantern.	24 16	
14	Black Rocks	42 25 (55) 70 56 (57)	Fixed red	Post lantern.	20	
15	Sandy Point	42 26 (26) 70 56 (36)	Fixed red	Post lantern.	20	
16	Black Marsh Channel	42 26 (53) 70 56 (35)	Fixed red	Post lantern.	20	
17	Upper Turn Beacon	42 27 (12) 70 56 (34)	Fixed white	Post lantern.	20	
	BOSTON BAY:					
18	*Boston Light-vessel, No. 54*	42 20 (22) 70 45 (26)	Two fixed red	Refl'r	38 38	11½
19	MINOTS LEDGE	42 16 11 70 45 35	Flashing white, signaling "143" every 30 seconds, thus: 1 flash, eclipse 3 seconds; 4 flashes, eclipse 3 seconds; 3 flashes, eclipse 15 seconds.	2	84½	14¾
20	BOSTON	42 19 41 70 53 26	Flashing white every 30 seconds	2	102	15¾
21	BOSTON (Auxiliary)		Fixed white between two fixed red sectors; one red sector between NE. ⅞ E. and NE. by E. ⅜ E.; the other red sector between ENE. ⅛ E. and ENE. ⅞ E.	Refl'r	34	
22	Narrows	42 19 (22) 70 55 (11)	Fixed red	5	45	8½
23	Windmill Point Beacon	42 18 (10) 70 55 (20)	Fixed red	Lens lantern.	20	
24	Range. Lovells Island Front	42 19 (59) 70 55 (49)	Fixed white	4	31	
25	Range. Lovells Island Rear		Flashing red every 5 seconds	4	40	

CAPE ANN TO POINT JUDITH.

These pamphlets, which are corrected and reprinted from time to time, are sent free of charge to any shipmaster on application to the Office of the Light-House Board, Washington, D. C., or to the Inspector of the Second Lighthouse District, Post-Office Building, Boston, Mass., and Inspector of the Third Lighthouse District, Tompkinsville, Staten Island, N. Y. They can also be had on application at the United States Branch Hydrographic Offices, Customhouse, Boston, Mass., and Maritime Exchange, Produce Exchange Building, New York City.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
1	Two gray-stone towers; lanterns, black. Work rooms, stone color; covered walks and northerly dwelling, white; one southerly dwelling light-drab and one white. Brick fog-signal house near easterly shore of island, and white oilhouse about midway between towers.	112½	10-inch steam whistle; alternate blasts of 8 and 4 seconds; alternate silent intervals of 4 and 44 seconds.
2		112½	
3	White conical tower with black lantern; white dwelling to eastward and white bell tower to westward; white covered way connects tower, dwelling, and bell-tower; white oilhouse 135 feet NW. and a white signal mast, 65 feet high, 131 feet ESE. ⅝ E. from light-tower.	30¾	A 4,000-pound bell struck by machinery a double blow every 20 seconds.
4			*To be established.*
5	Brown conical tower; lantern, black. White dwelling E. of tower	25	
6	Two white towers; lanterns, black. Southeasterly tower, conical; northwesterly tower, low octagonal pyramid, connected with a white dwelling by a covered way, 64 feet long. White bell-tower N. of southeasterly tower. White brick oilhouse 320 feet W. by N. from northwesterly tower.	54¼	Bell struck by machinery a single and a double blow alternately, intervals 30 seconds.
7		34½	
8	White pyramidal tower; lantern, black. Dwelling and outhouses, white; red-brick oilhouse 103 feet easterly from tower.	40	
9	Brown conical tower with white base; lantern, black. White bridge from tower to shore.	32¼	
10	Red square tower, with black lantern	17½	
11	Square, pyramidal, skeleton iron tower with central stair cylinder; brown from foundation to gallery floor, black above; a white covered way, 150 feet long, connects with dwelling. Dwelling and outhouses white.	100	
12	Black lantern and square gallery, on square, pyramidal, white brick tower, attached to white wooden dwelling.	32	
13	Black spindle surmounting a black pile dolphin		
14	Black spindle surmounting a black pile dolphin		
15	Black spindle surmounting a black pile dolphin		
16	Black spindle surmounting a black pile dolphin		
17	Red spindle surmounting a red pile dolphin		
18	Steam light-vessel, two masts, schooner-rigged, no bowsprit. Mastheads white, with a red, circular, iron cage-work daymark at each. Hull red, with "BOSTON" in white on each side and "54" in white on each bow. A black smokestack and the fog signal between the masts.		12-inch steam chime whistle; blasts 5 seconds, silent intervals 55 seconds. If whistle be disabled a bell will be rung by hand.
19	Dark-gray, conical granite tower, with black lantern	89	Bell struck by machinery every 30 seconds.
20	White conical tower; lantern, black. White dwelling large, rain sheds; white; brick fog-signal house with frame annex, and square white building grouped closely about tower. Another white dwelling and small white structure to westward of group. Small white oilhouse to southward of westerly dwelling.	80½	1st-class steam siren; blasts 5 seconds, alternate silent intervals of 10 and 40 seconds.
21	Small, white wooden structure	9	
22	Black lantern on white hexagonal dwelling; pile foundation	45	Bell struck by machinery every 20 seconds.
23	White post		
24	Black lantern on white conical tower	26	
25	Black lantern on white conical tower	37	

TABLE OF LIGHTS.

Number.	Name.	Latitude north. Longitude west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
	BOSTON BAY—Continued.	° ′ ″				
26	Deer Island	42 20 (24) 70 57 (18)	Fixed white varied by a red flash every 30 seconds.	5	53	12¾
27	Long Island Head	42 19 (49) 70 57 (29)	Fixed white	3½	119½	16¾
28	Range. Broad Sound Channel Inner Front	42 19 (40) 70 59 (02)	Flashing white every 5 seconds	4	53	-------
29	Range. Broad Sound Channel Inner Rear	-------	Fixed red	4	70	-------
30	Range. Spectacle Island Front	42 19 (41) 70 59 (07)	Fixed red	Refl'r	29	-------
31	Range. Spectacle Island Rear	42 19 (39) 70 59 (04)	Fixed red	Refl'r	54	-------
32	Range. South Boston Front	42 19 (57) 71 01 (18)	Two fixed red, electric arc	Refl'r	{34} {34}	-------
33	Range. South Boston Rear	42 19 (54) 71 01 (46)	Fixed red, electric arc	Refl'r	45	-------
34	Scituate Breakwater	-------	Fixed red	Post lantern.	31	-------
	CAPE COD BAY:					
35	Range. Plymouth (Gurnet)	42 00 12 70 36 04	Fixed white; *obscured between N. by W. ¾ W. and N. ¼ E.*	4	102¼	15¾
36	Range. Plymouth (Gurnet) Beacon	-------	Fixed white	4	102¼	15¾
37	Duxbury Pier	41 59 15 70 38 57	Fixed red	5	34¾	8½
38	Race Point	42 03 45 70 14 37	Fixed white varied by a white flash every 90 seconds; *obscured when bearing about SE. by E. ⅜ E.*	4	41¼	11¾
39	Wood End	42 01 17 70 11 38	Flashing red every 15 seconds	5	45	12
40	Long Point	42 01 59 70 10 09	Fixed white	5	35½	11¼
41	Mayo Beach	41 55 (49) 70 02 (05)	Fixed white	Refl'r	36	-------
42	Billingsgate Island	41 52 18 70 04 10	Fixed white	4	41¼	11¾
43	Sandy Neck	41 43 22 70 16 53	Fixed white	5	47¾	12¼
44	CAPE COD	42 02 23 70 03 40	Flashing white every 5 seconds	1	183	19¾
45	NAUSET BEACH	41 51 (39) 69 57 (05)	Fixed white	4	97	15½
46	-------	-------	Fixed white	4	97	15½
47	-------	-------	Fixed white	4	97	15½
48	CHATHAM (N.)	41 40 18 69 57 01	Fixed white	4	79¾	14½
49	CHATHAM (S.)	41 40 17 69 57 01	Fixed white	4	79¾	14½
	EASTERLY ENTRANCE TO NANTUCKET SOUND:					
50	*Pollock Rip Shoals Light-vessel, No. 73*	41 36 (40) 69 53 (47)	{Fixed white (foremast) {Fixed red (mainmast) Three lanterns encircling each masthead.	Lens lantern.	{30 {42	10½ 11¾
51	*Pollock Rip Light-vessel, No. 47*	41 32 (17) 69 54 (36)	Two fixed red	Refl'r	{37} {37}	11¼
52	MONOMOY POINT	41 33 34 69 59 39	Fixed white with a fixed red sector between W. ¼ S. and W. ⅞ N.	4	47	12¼

CAPE ANN TO POINT JUDITH.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
26	Brown conical tower; lantern, black; on black, cylindrical foundation pier expanding in trumpet shape under main gallery, gallery covered by roof.		Bell struck by machinery every 10 seconds.
27	White brick tower; lantern, black. White dwelling 30 feet SW. of tower, and connected to it by a white covered way, white oilhouse near the crest of the bank, 170 feet WSW. ⅜ W., white barn 145 feet SSW. ¾ W., and white fuel house 100 feet S. by W. ½ W. of tower.	45½	
28	Black lantern on red conical tower	24	
29	Black lantern on red conical tower	35	
30	White, octagonal, pyramidal, shingled tower	13	
31	White, octagonal, pyramidal, shingled tower	23	
32	Lanterns 10 feet apart horizontally, suspended from a white mast, with black ironwork, on roof of covered way.		
33	White mast with black ironwork		
34	Lantern suspended from a spar		
35	Two white octagonal, pyramidal towers, connected by covered way; lanterns, black; dwelling, white, with green blinds. White oilhouse about 90 feet SW. by W. and white signal mast, 65 feet high, 264 feet NE. by E. from southerly tower.	34	
36		34	
37	Brown conical tower surrounded by a gallery; lantern, black	42	A 1,000-pound bell struck by machinery every 15 seconds.
38	Brown tower; lantern, black. Two white dwellings and barn. A brick fog-signal house about 150 feet northerly and a white signal mast, 65 feet high, 280 feet WSW. from tower.	35	10-inch or 12-inch steam whistle; blasts 4 seconds, alternate silent intervals of 8 and 44 seconds.
39	White pyramidal tower; lantern, black. White dwelling 50 feet to NE	34	Bell struck by machinery every 15 seconds.
40	White square tower; lantern, black. White dwelling to the southward, and bell-tower to the northward.	32	Bell struck by machinery a single and a double blow alternately, intervals 30 seconds.
41	Brown tower; lantern, black. White dwelling, westerly of tower and close to it	25	
42	Red square tower, connected with dwelling by a short covered way; lantern, black	33½	
43	White tower; lantern, black. White dwelling, 20 feet westerly of tower	40¾	
44	White tower and dwellings, connected by white covered ways; lantern, black. White fog-signal house to northeastward of dwelling.	55	First-class Daboll trumpet; blasts 8 seconds, silent intervals 30 seconds.
45	Three white conical towers, shingled, 150 feet apart, ranging N. and S.; lanterns, black; dwelling and barn white. White signal mast, 65 feet high, 83 feet SSE. ⅞ E. from middle tower; white oilhouse about 150 feet westward from north tower.	22	
46		22	
47		22	
48	Two white conical towers 100 feet apart, ranging N. and S.; lanterns, black. White dwelling between the towers. White brick oilhouse 90 feet S. from south tower.	42½	
49		42½	
50	Flush-deck steam light-vessel; two masts, schooner-rigged, no bowsprit; red, circular, wire daymark at each masthead. Hull red, with "Pollock Rip Shoals" in white on each side, and "73" in white on each bow and each quarter. Masts, brown; black smokestack and the fog signal between the masts. Boats, red; lamphouses, white.		12-inch steam chime whistle; blasts 3 seconds, silent intervals 12 seconds. If whistle be disabled a bell will be rung by hand.
51	Two masts, schooner-rigged, no bowsprit; red hoop-iron day mark at each masthead. Hull red, with "Pollock Rip" in white on each side, and "47" in white on each bow and on stern. A black smokestack and the fog signal are between the masts.		12-inch steam chime whistle; blasts 5 seconds, silent intervals 25 seconds. If whistle be disabled a bell will be rung by hand.
52	Red tower, connected with white dwelling by covered way; lantern, black. White oilhouse 123 feet NNW. and white signal mast, 65 feet high, 197 feet SSE. ⅛ E. from tower.	34¾	

TABLE OF LIGHTS.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
		° ′ ″				
53	*Shovelful Shoal Light-vessel, No. 3*	41 32 (42) 69 59 (17)	Fixed red	Refl'r	40	11½
54	*Handkerchief Light-vessel, No. 4*	41 29 (14) 70 04 (00)	Two fixed white	Lens lantern. R'fl'r	40 40	11½
55	*Great Round Shoal Light-vessel, No. 42*	41 24 (10) 69 54 (55)	Two fixed white	Refl'r	45 45	12
56	NANTUCKET (Great Point)	41 23 24 70 02 46	Fixed white with a fixed red sector between E. ⅝ S. and SE. by E. ½ E.	3	69¾	13¾
57	SANKATY HEAD	41 17 01 69 57 57	Fixed white varied by a white flash every minute.	2	166	19
58	*Nantucket Shoals Light-vessel, No. 66*	40 37 (05) 69 36 (33)	Two fixed white 12 seconds, eclipse 3 seconds; four lanterns encircling each masthead; electric. If the electric-light apparatus should become inoperative, the lights will show fixed white *without eclipses* and will be *less brilliant* than the electric lights.	Lens lantern.	57 57	13
59	GAY HEAD	41 20 55 70 50 08	Flashing white and red; every fourth flash red; interval between flashes 10 seconds; *obscured between N. ½ W. and N. by E.*	1	170	19¼
	NANTUCKET SOUND:					
60	Brant Point	41 17 24 70 05 27	Fixed white	4	26	10¼
61	Range. Nantucket Cliff Front	41 17 38 70 06 24	Fixed white	Refl'r	15¾	-------
62	Range. Nantucket Cliff Rear	41 17 36 70 06 25	Fixed red	Refl'r	26¼	-------
63	Nantucket West Breakwater Beacon		Fixed red	Lens lantern.	12	-------
64	Nantucket East Breakwater Beacon		Fixed white	Lens lantern.	12	-------
65	Stage Harbor	41 39 32 69 59 03	Fixed white	4	40	11½
66	Bass River	41 39 06 70 10 11	Fixed white	5	41	11½
67	Bishop and Clerks	41 34 28 70 15 02	Flashing white with a flashing red sector between N. ½ W. and NNE. ½ E., interval between flashes 30 seconds.	4	56¼	13
68	Range. Hyannis	41 38 11 70 17 20	Fixed red	Refl'r	42½	-------
69	Range. Hyannis Beacon	41 38 (00) 70 17 (22)	Fixed red	Refl'r	22	-------
70	*Cross Rip Light-vessel, No. 5*	41 26 (43) 70 17 (29)	Fixed red	Refl'r	39	11½
71	*Succonnesset Shoal Light-vessel, No. 6*	41 31 (56) 70 26 (15)	Fixed white	Refl'r	40	11½
72	Cape Poge	41 25 16 70 27 06	Flashing white and red, every third flash red; interval between flashes 5 seconds.	4	53¾	12¾
	VINEYARD SOUND:					
73	Edgartown	41 23 27 70 30 13	Fixed white	4	48	12¼
74	Cottage City South Breakwater Beacon	41 27 (38) 70 33 (25)	Fixed green	Post lantern.	14½	-------
75	Cottage City North Breakwater Beacon	41 27 (40) 70 33 (26)	Fixed red	Post lantern.	14½	-------
76	East Chop	41 28 (13) 70 34 (05)	Flashing red every 10 seconds	4	79	14½

CAPE ANN TO POINT JUDITH.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
53	Two masts, schooner-rigged, no bowsprit, red hoop-iron daymark at main masthead. Hull black, with white stripe covering bulwarks; "SHOVELFUL" in black on each side, and "3" in black on each quarter.		Bell or horn.
54	Two masts, schooner-rigged, no bowsprit, black hoop-iron daymark at each masthead. Hull, straw-color, with "HANDKERCHIEF" in black on each side, and "No. 4" in black on each quarter. Lens lantern at foremast head.		Bell or horn.
55	Two masts, schooner-rigged, no bowsprit, lead-colored iron daymark at each masthead. Hull, lead-color, with "GREAT ROUND SHOAL" in black on each side, and "42" in black on each bow and on the stern. A black smokestack and the fog signal are between the masts.		10-inch whistle operated by compressed air; blasts 5 seconds, silent intervals 55 seconds. If whistle be disabled a bell will be rung by hand.
56	White tower with covered way and white frame dwelling; lantern, black. Small white oilhouse to southward of dwelling.	65½	
57	Tower white near the top and bottom, with red band in the middle; lantern, black. A white, framed, double dwelling and barn near southerly side of tower. White oilhouse 170 feet N. of tower.	62	
58	Flush-deck, steam light-vessel, two masts, schooner-rigged, no bowsprit. Circular white gallery under the lens lanterns at each masthead. Hull, red with "NANTUCKET SHOALS" in white on each side, and "66" in white on each bow and each quarter. A large and a small black smokestack and the fog signal are between the masts.		12-inch steam chime whistle; blasts 5 seconds, silent intervals 25 seconds. If whistle be disabled a bell will be rung by hand.
59	Red tower and dwelling, connected by a short covered way; lantern, black. Barn and sheds, white. White oilhouse near bluff, northwesterly from tower.	40	
60	White, cylindrical, shingled tower, on pile foundation; black lantern: footbridge to higher part of shore; dwelling connected by a short covered way, with discontinued lighthouse 596 feet W. $\frac{9}{16}$ N. from new tower.	26	
61	Two small, white, pyramidal structures, with red roofs	11	
62		23¼	
63	Black post on a conical pile of riprap stone		
64	Black post on a conical pile of riprap stone		
65	Brown tower; lantern, black; brown dwelling, 50 feet southerly of tower	36¼	
66	Black lantern on white dwelling	30	
67	Gray granite tower, with lead-colored fog-bell tower attached to the westerly side; lantern, black.	59½	Bell struck by machinery every 15 seconds.
68	White tower and dwelling connected by a short covered way; lantern, black; red-brick oilhouse 110 feet southerly from tower.	19¾	
69	Small frame shed, lead-color	15	
70	Two masts, schooner-rigged, no bowsprit; white hoop-iron daymark at each masthead. Hull, black, with white stripe; and "CROSS RIP" in white on each side, and "5" in white on each quarter.		Bell or horn.
71	Two masts, schooner-rigged; red hoop-iron daymark at mainmast head. Hull, straw-color, with "SUCCONNESSET" in black on each side, and "6" in black on each quarter.		Bell or horn.
72	White conical wooden tower, shingled; lantern, black. A white double dwelling southerly, and a white brick oilhouse 242 feet WSW. ¾ W. from tower.	34¼	
73	Black lantern on white dwelling. A bridge, ¼ mile long, connects station with the shore. Gray oilhouse on bridge.	36	
74	Red iron spindle		
75	Red iron spindle		
76	Brown tower; lantern, black. Dwelling and wood shed, white; white brick oilhouse 90 feet S. by E. from light-tower.	35¼	

TABLE OF LIGHTS.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
	VINEYARD SOUND—Continued.	° ′ ″				
77	West Chop	41 28 (51) 70 36 (01)	Fixed white with a fixed red sector between WNW. and N. by W. ¾ W.	4	83½	14¾
78	Nobska Point	41 30 57 70 39 20	Fixed white with a fixed red sector between W. ¼ N. and NW. by W. ⅝ W.	4	86½	15
79	Grassy Island Ledge Beacon	41 31 (16) 70 40 (35)	Fixed red	Post lantern.	13	------
80	Middle Ledge Beacon	41 31 (07) 70 41 (03)	Two fixed red	Post lantern.	{24} {18}	------
81	Tarpaulin Cove	41 28 08 70 45 29	Fixed white varied by a white flash every 30 seconds.	4	77½	14½
82	GAY HEAD	41 20 55 70 50 08	Flashing white and red; every fourth flash red; interval between flashes 10 seconds; *obscured between N. ½ W. and N. by E.*	1	170	19¼
83	*Vineyard Sound (Sow and Pigs) Light-vessel, No. 41*	41 22 (47) 71 00 (00)	Two fixed red	Refl'r	{34} {34}	11
84	*Hen and Chickens Light-vessel, No. 2*	41 27 (02) 71 01 (06)	Fixed white	Refl'r	25	10
	BUZZARDS BAY:					
85	Cuttyhunk	41 24 (52) 70 57 (00)	Fixed white	5	61	12¾
86	Dumpling Rock	41 32 (18) 70 55 (19)	Fixed white with a fixed red sector between NE. ½ N. and NE. ¾ E.	5	48	12¼
87	Butler Flats	41 36 14 70 53 42	Flashing white every 5 seconds	5	53	12¾
88	Range. Palmer Island	41 37 37 70 54 35	Fixed red	5	34¼	8½
89	Range. Wamsutta Mill	41 38 (54) 70 55 (35)	Fixed white	Electric	91½	------
90	Ned Point	41 39 (03) 70 47 (46)	Fixed white	Lens lantern.	40½	------
91	Bird Island	41 40 (10) 70 43 (04)	Fixed white varied by a white flash every 80 seconds.	5	37	11¼
92	Wings Neck	41 40 (49) 70 39 (42)	Fixed white	5	49¾	12¼
93	Sakonnet	41 27 11 71 12 10	Fixed white 30 seconds, followed by three red flashes, interval between flashes 10 seconds.	4	68¼	14
94	*Brenton Reef Light-vessel, No. 39*	41 25 (52) 71 22 (36)	Two fixed white	Refl'r	{38} {38}	11½
95	BEAVERTAIL	41 26 58 71 24 00	Eight white flashes, interval between flashes nearly 2 seconds, interval between groups of flashes 15 seconds.	4	64¼	13½
	NARRAGANSETT BAY:					
	EASTERN PASSAGE.					
96	Castle Hill	41 27 44 71 21 48	Flashing red every 30 seconds	5	40¼	11½
97	Fort Adams Fog-Signal Station	41 28 (53) 71 20 (15)	------	------	------	------
98	Lime Rock	41 28 39 71 19 35	Fixed red	6	28¼	7½
99	Newport Harbor	41 29 36 71 19 39	Fixed white 15 seconds, eclipse 5 seconds	4	31¼	10¾
100	Rose Island	41 29 44 71 20 36	Fixed red	6	48¼	7½
101	Gull Rocks	41 30 09 71 20 01	{Fixed white (E. light) {Fixed red (W. light)	Lens lantern.	42¼	------

CAPE ANN TO POINT JUDITH.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
77	Cylindrical, white, brick tower, with brick service room attached; lantern, black; two white dwellings. Fog-signal house, white, with red roof, about 100 feet NE. of tower. White brick oilhouse 218 feet E. ⅝ S. of tower.	50½	10-inch steam whistle; blasts 3 seconds, silent intervals 27 seconds.
78	Brown tower; lantern, black. A brown dwelling, with white trimmings, 40 feet E. of the light-tower, to which it is connected by a white covered way. Bell-tower 320 feet SW., and red-brick oilhouse 160 feet ENE. 7/16 E. from light-tower.	35	Bell struck by machinery a single and a double blow alternately, intervals 30 seconds.
79	Red iron spindle with cask on end on top		
80	Lanterns hung one vertically below the other, on black iron spindle with cask on its bilge on top.		
81	White tower; lantern, black; white dwelling and barn; pyramidal, shingled bell-tower at water's edge, westerly from light-house.	34½	Bell struck by machinery every 15 seconds.
82	Red tower and dwelling, connected by a short covered way; lantern, black. Barn and sheds, white. White oilhouse, near bluff, northwesterly from tower.	40	
83	Two masts, schooner-rigged, no bowsprit; red hoop-iron daymark at each masthead. Hull red, with "VINEYARD SOUND" in white on each side, and "41" in white on each bow and on the stern. A smokestack and the fog signal are between the masts.		12-inch steam whistle; blasts 6 seconds, silent intervals 45 seconds. If whistle be disabled a bell will be rung by hand.
84	Two masts, schooner-rigged, no bowsprit; black hoop-iron daymark at mainmast head. Hull, black, with "HEN & CHICKENS" in white on each side, and "No. 2" in white on each quarter.		Bell or horn.
85	White, conical, shingled tower with black lantern; connected by a white covered way, with a white frame dwelling.	39¾	
86	Black lantern on white frame tower attached to northeasterly corner of white frame dwelling. White fog-signal house 85 feet and red-brick oilhouse 110 feet southerly of lighthouse. Timber bulkhead on easterly side of rock, outside of buildings.	35	Second-class Daboll trumpet; blasts 3 seconds, silent intervals 12 seconds. If trumpet be disabled a bell will be struck by hand.
87	Black cylindrical foundation surmounted by a conical, white, brick tower with a brown watchroom and black lantern. A white gallery with roof surrounds the base of the tower.		Bell struck by machinery a double blow every 15 seconds.
88	White tower, connected with higher part of island by a white covered way 95 feet long; lantern, black; white dwelling 278 feet SW. by W. ¼ W. from light-tower; square, white, pyramidal bell-tower, connected with shore by a bridge, 180 feet SSW. ½ W. from light-tower.	34	Bell struck by machinery every 10 seconds.
89			
90	White tower connected to white dwelling by covered way; lantern, black	33½	
91	White tower and white frame dwelling; lantern, black	31	Bell struck by machinery a double blow every 12 seconds.
92	White, hexagonal, frame tower 20 feet southwesterly from and connected to a white frame dwelling by a covered way; lantern, black.	32¾	Bell struck by machinery every 10 seconds.
93	White conical tower on brown cylindrical foundation; lantern, black	43	
94	Two masts, schooner-rigged, no bowsprit; circular, black, cagework daymark at each masthead. Hull, straw-color, with "BRENTON REEF, No. 39," in black on each side; black smokestack and two whistles between the masts.		12-inch and 6-inch steam whistles; blasts, low tone 3 seconds, higher tone 3 seconds, silent intervals 24 seconds.
95	Square granite tower, upper half white, attached to southeasterly angle of white dwelling. Fog-signal building about 80 feet southerly of tower.	45½	Second-class compressed-air siren; blasts 4 seconds, alternate silent intervals of 10 and 50 seconds.
96	Conical, granite tower, upper half white, on granite pier; lantern, black		Bell struck by machinery every 30 seconds.
97	Square, pyramidal frame tower, base white, upper part shingled, natural color		Bell struck by machinery every 10 seconds.
98	Lantern on northwesterly corner of white dwelling	13	
99	White, stone tower and attached dwelling	29	Bell struck by machinery every 15 seconds.
100	Black lantern on white dwelling, with Mansard roof	30	Bell struck by machinery a double blow every 15 seconds.
101	Wedge-shaped, wooden building, shingled, natural color, with truncated gable ends	33	Bell struck by machinery every 5 seconds.

TABLE OF LIGHTS.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
	NARRAGANSETT BAY—Continued.					
	EASTERN PASSAGE—Continued.	° ′ ″				
102	Gould Island	41 32 03 71 20 37	Flashing white every 10 seconds	5	50¼	12½
103	Prudence Island	41 36 21 71 18 14	Fixed white	5	28	10½
104	Hog Island Shoal	41 37 (57) 71 16 (22)	Fixed white; dark sector between SE. ¾ E. and S. ⅝ W., covering Hog Island.	4	53½	12½
105	Muscle Bed Shoals	41 38 11 71 15 38	Fixed red	6	33	7½
106	Bristol Ferry	41 38 34 71 15 39	Fixed white	5	33	11
107	Borden Flats	41 42 16 71 10 29	Flashing white every 10 seconds	5	48	12
	NARRAGANSETT BAY:					
	WESTERN PASSAGE—					
108	Whale Rock	41 26 40 71 25 27	Fixed red	4	71	11¼
109	Dutch Island	41 29 48 71 24 17	Fixed white	4	54¼	12¾
110	Plum Beach	41 31 49 71 24 20	Flashing white every 5 seconds	4	53.75	13
111	Wickford Harbor	41 34 22 71 26 14	Fixed white	5	50	12½
112	Conanicut Island	41 34 25 71 22 20	Fixed red	5	45¼	8½
113	Warwick	41 40 01 71 22 43	Fixed white	4	52	12½
	PROVIDENCE RIVER:					
114	Conimicut	41 43 01 71 20 44	Fixed white with a fixed red sector between N. by W. ¼ W. and N. ¾ W.	4	58	13
115	Bullock Point	41 44 16 71 21 53	Fixed red	6	48	7½
116	Sabine Point	41 45 44 71 22 33	Fixed red	6	49	7½
117	Pomham Rocks	41 46 40 71 22 12	Fixed red	6	67	7½
118	Fuller Rock	41 47 39 71 22 49	Fixed red	6	26	7½
119	Sassafras Point	41 48 01 71 23 31	Fixed red	6	23	7½
120	POINT JUDITH	41 21 40 71 28 55	Flashing white every 15 seconds	4	65	13½

In the foregoing table the names of the lights are printed as follows, viz:

1st. PRIMARY SEACOAST LIGHTS.

2d. SECONDARY SEACOAST LIGHTS.

3d. *Light-vessels.*

4th. Sound, bay, and harbor lights.

The geographical positions of lights which are uncertain by some seconds, not having yet been accurately determined, and those of light-vessels which vary somewhat in position, have the seconds inclosed thus: 80° 45′ (57″). The geographical positions which are given without having the seconds so inclosed are furnished by the Coast and Geodetic Survey and have been accurately determined by triangulation.

CAPE ANN TO POINT JUDITH.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
102	Conical tower, upper half white, lower half red-brick color, surmounted by a black lantern. Keeper's dwelling—first story, red brick; second story and roof, shingled, natural color; 30 feet southerly of tower.	30	Bell struck by machinery every 15 seconds.
103	White octagonal tower; white fog-signal structure northeasterly of tower	25	Bell struck by machinery every 15 seconds.
104	Black, cylindrical, iron pier, supporting a white gallery, surmounted by a white, conical, iron tower; white conical roof surrounds lower part of tower and covers gallery; lantern, black.		Compressed-air siren; blasts 3 seconds, silent intervals 10 seconds.
105	Lantern on gable of small red dwelling, on square granite pier	19	Bell struck by machinery every 20 seconds.
106	White square tower; dwelling attached; lantern, black	28	
107	White conical tower on brown cylindrical foundation; lantern, black	35	Bell struck by machinery every 15 seconds.
108	White conical tower on red cylindrical foundation; lantern, black	73	Bell struck by machinery a double blow every 20 seconds.
109	White square tower and attached dwelling	35	Bell struck by machinery every 15 seconds.
110	Black cylindrical pier expanding in trumpet shape at its upper end to form a gallery, above which rises a conical tower, lower half white, upper half brown, surmounted by a brown lantern. A brown conical roof surrounds the lower part of tower and covers the gallery.		Bell struck by machinery a double blow every 30 seconds.
111	White square tower and attached dwelling on a red iron pier; lantern, black	42	Bell struck by machinery every 20 seconds.
112	Square wooden tower on corner of frame dwelling. Tower and dwelling, white; lantern, black.	37	Compressed-air siren; blasts 3 seconds, silent intervals 17 seconds. If siren be disabled a bell will be struck by machinery a double blow every 10 seconds.
113	White square tower on old, stone dwelling; detached frame dwelling to northward	28	Compressed-air siren; blasts 3 seconds, silent intervals 3 seconds. If siren be disabled a bell will be struck by machinery a single and a double blow alternately, intervals 20 seconds.
114	White conical tower on brown cylindrical foundation; boat platforms on easterly and westerly sides.	60	Bell struck by machinery every 15 seconds.
115	White dwelling, with gable roof, from the middle of which rises a square tower, surmounted by black lantern with black railings. The structure stands on a rectangular granite pier.	35	
116	White octagonal tower, on granite dwelling with Mansard roof; lantern, black. The structure stands on a pier of rock-faced granite.	36	Bell struck by machinery every 9 seconds.
117	White square tower in the center of the front of a dwelling with red Mansard roof; lantern black; fog-signal house southwesterly of dwelling.	37	Bell struck by machinery a double blow every 20 seconds.
118	White, hexagonal, portable beacon, on granite pier; lantern, black	14	
119	White, hexagonal, portable beacon, on a granite pier; lantern, black	14	
120	Octagonal pyramidal tower, lower half white, upper half brown, connected with dwelling. Fog-signal building southerly of tower.	46	First-class compressed-air siren; blasts 5 seconds, silent intervals 40 seconds.

In the column "Characteristic of light," the time interval of flashing lights is given from the beginning of one flash to the beginning of the next following flash.

In the column "Distance visible, in nautical miles," will be found the distances within which the lights can be seen, under ordinary conditions of the atmosphere, the height of the light being measured from mean high water and the eye of the observer taken at an elevation of fifteen feet above sea level.

The fact should be noted that sound signals are not always reliable. The sound may be lost while really approaching it, after being heard; or even when approached until close-to, it may not be heard at all, though properly made. These conditions are the exception, not the rule. They are, however, always possible and render great care necessary.

All bearings are *magnetic*, and in the case of visibility of lights given from seaward.

BEARINGS AND DISTANCES.

The following bearings and distances serve to indicate relative positions of certain aids to navigation along the coast. An inspection of the charts will enable the mariner to select from the bearings given the ones which may be used as courses.

Cape Ann Lighthouses.—The following are bearings and distances from Cape Ann Lighthouses:

	Miles.
Portsmouth Harbor (New Castle) Lighthouse, N. ⅛ E	26¼
Boon Island Lighthouse, NNE	29
Cape Elizabeth (East) Lighthouse, NNE. ¾ E	58
Cape Elizabeth Light-vessel, NE. ¾ N	57
Seguin Lighthouse, NE	73
Monhegan Island Lighthouse, NE. ¾ E	87
Matinicus Rock Lighthouses, NE. by E. ⅝ E	102
Mount Desert (Rock) Lighthouse, ENE. ⅛ E	132½
Cape Cod Lighthouse, S. by E. ¾ E	42¼
Race Point Lighthouse, S. ⅞ E	37¼
Sandy Neck Lighthouse, S	56
Gurnet (Plymouth) Lighthouse, S. by W. ⅝ W	37¾
Minots Ledge Lighthouse, SW. by S	23½
Boston Light-vessel, SW. ⅝ S	19½
Boston Lighthouse, SW. ½ W	23
Long Island Head Lighthouse, SW. by W	25
Eastern Point Lighthouse, SW. by W. ½ W	5¼
Egg Rock Lighthouse, SW. by W ½ W	18¾

Eastern Point Lighthouse.—The following are bearings and distances from Eastern Point Lighthouse:

	Miles.
Cape Cod Lighthouse, SSE. ⅝ E	42
Race Point Lighthouse, S. by E. ⅝ E	36½
Sandy Neck Lighthouse, S. ¼ E	54
Gurnet (Plymouth) Lighthouse, S. ¾ W	34¾
Minots Ledge Lighthouse, SSW. ¼ W	19⅛
Boston Light-vessel, SSW. ⅜ W	15
Whistling buoy off NE. Graves, SW. ⅝ W	15
Baker Island Lighthouse, WSW. ⅞ W	6

Boston Light-vessel.—The following are bearings and distances from Boston Light-vessel:

	Miles.
Baker Island Lighthouse, N. ⅝ E	11⅞
Cape Ann whistling buoy, NE	20⅝
Monhegan Island Lighthouse, NE. ½ E	106
Matinicus Rock Lighthouses, NE. by E. ¼ E	120
Mount Desert (Rock) Lighthouse, NE. by E. ¾ E	150
Peaked Hill Bar whistling buoy, SE. ⅝ E	31
Cape Cod Lighthouse, SE. ¼ E	35¾
Race Point Lighthouse, SE. ⅝ S	28
Billingsgate Island Lighthouse, SE. ⅞ S	41½
Sandy Neck Lighthouse, S. by E. ½ E	42½
Gurnet (Plymouth) Lighthouse, S. ½ E	21¼
Minots Ledge Lighthouse, S. by W. ¼ W	4¼
Boston Lighthouse, W. ½ N	5⅞
Whistling buoy off NE. Graves, NW. ⅝ W	5⅛
Nahant Head, NW. ⅝ N	8
Marblehead Lighthouse, N. ½ W	10½

Race Point Lighthouse.—The following are bearings and distances from Race Point Lighthouse:

	Miles.
Buoy off end of Billingsgate Shoal, S	14¾
Sandy Neck Lighthouse, S. by W. ½ W	20¼
Gurnet (Plymouth) Lighthouse, W	16½
Minots Ledge Lighthouse, NW. ⅝ W	26¼
Boston Lighthouse, NW. ¼ W	33
Nahant Head, NW. ⅝ N	36
Marblehead Lighthouse, NNW. ⅞ W	37¼
Baker Island Lighthouse, NNW. ½ W	37

Cape Cod Lighthouse.—The following are bearings and distances from Cape Cod Lighthouse:

	Miles.
Cape Elizabeth (East) Lighthouse, N. $\frac{7}{8}$ E	91½
Cape Elizabeth Light-vessel, N. by E. ½ E	89
Seguin Lighthouse, N. by E. ¾ E	100¾
Monhegan Island Lighthouse, NNE. ⅞ E	108
Matinicus Rock Lighthouses, NE. ¼ N	117½
Mount Desert (Rock) Lighthouse, NE. ⅝ E	143
Minots Ledge Lighthouse, NW. ¾ W	34
Boston Lighthouse, NW. ⅝ W	40½
Marblehead Lighthouse, NW. ⅝ N	44
Baker Island Lighthouse, NW. ⅞ N	43½
Isles of Shoals Lighthouse, N. by W	61
Boon Island Lighthouse, N. ¼ W	67½

Nantucket (Great Point) Lighthouse.—The following are bearings and distances from Nantucket (Great Point) Lighthouse:

	Miles.
Handkerchief Light-vessel, N. ¼ E	6
Monomoy Point Lighthouse, NNE. ¼ E	10⅝
Shovelful Shoal Light-vessel, NNE. ¼ E	9⅝
Pollock Rip Shoals Light-vessel, NE. ½ N	15
Pollock Rip Light-vessel, NE. ⅛ E	10⅞
Whistling buoy Entrance to South Channel, E. ⅛ S	15⅛
Great Round Shoal Light-vessel, E. ⅝ S	6
Sankaty Head Lighthouse, S. by E. ½ E	7¼
Bell buoy off Nantucket Entrance, SW. ½ S	5⅛
Cape Poge Lighthouse, WNW. ⅝ W	18⅝
East Chop Lighthouse, NW. by W. ⅞ W	24
Cross Rip Light-vessel, NW. by W. ⅝ W	11⅝
Bishop and Clerks Lighthouse, NNW. ½ W	14⅜
Bass River Lighthouse, N. ⅝ W	16⅝

Handkerchief Light-vessel.—The following are bearings and distances from Handkerchief Light-vessel:

	Miles.
Monomoy Point Lighthouse, NE. ⅝ E	5⅝
Shovelful Shoal Light-vessel, NE. by E. ⅛ E	5
Pollock Rip Shoals Light-vessel, NE. by E. ⅛ E	10⅝
Pollock Rip Light-vessel, E. by N	7⅝
Great Round Shoal Light-vessel, SE. ⅝ S	8⅝
Bell buoy off Nantucket Entrance, S. by W. ¾ W	10⅝
Cross Rip Light-vessel, W. ⅛ S	10⅝
Bishop and Clerks Lighthouse, NW	9⅞
Bass River Lighthouse, N. by W. ⅛ W	10⅞

Nobska Point Lighthouse.—The following are bearings and distances from Nobska Point Lighthouse:

	Miles.
Succonnesset Light-vessel, E. ½ S	9⅞
Cross Rip Light-vessel, SE. by E. ¾ E	17
Cape Poge Lighthouse, SE. ⅛ E	10¾
West Chop Lighthouse, SE. ⅝ S	3¼
Gay Head Lighthouse, SW. ½ W	12⅞
Tarpaulin Cove Lighthouse, WSW. ¼ W	5⅝

Gay Head Lighthouse.—The following are bearings and distances from Gay Head Lighthouse:

	Miles.
Tarpaulin Cove Lighthouse, NE. ⅝ N	8
Nantucket Shoals Light-vessel, SE. ⅛ S	71
NW. point No Mans Land, S. by W	5⅝
Diamond Shoal Light-vessel, SW. ⅝ S., southerly	431¼
Cape Charles Light-vessel, SW. ⅝ W., westerly	342½
Five Fathom Bank Light-vessel, SW. by W. ⅛ W	231
Fire Island Light-vessel, WSW. ¾ W	118⅛
Whistling buoy, WSW. ⅞ W	8
Block Island (SE.) Lighthouse W. ¾ S	34¼
Block Island (N.) Lighthouse, W	34¼
Little Gull Island Lighthouse, W. ¼ N	58
Race Rock Lighthouse, W. ¼ N	55
Watch Hill Lighthouse, W. ¾ N	46
Point Judith Lighthouse, WNW. ⅞ W	29
Brenton Reef Light-vessel, WNW	24⅝
Vineyard Sound Light-vessel, NW. by W. ¾ W	7⅝
Sakonnet Lighthouse, NW. by W. ⅛ W	17⅝
Cuttyhunk Lighthouse, NW. ¼ N	6⅛

Hen and Chickens Light-vessel.—The following are bearings and distances from Hen and Chickens Light-vessel:

	Miles.
Dumpling Rock Lighthouse, NE. ¼ E	6⅞
Wings Neck Lighthouse, NE. by E. ½ E	21⅛
N. end Penikese Island, E. ¾ S	4⅝
Cuttyhunk Lighthouse, SE. ⅛ S	3¾
Vineyard Sound Light-vessel, S	4⅜
Block Island (SE.) Lighthouse, SW. by W. ¾ W	29¾
Block Island (N.) Lighthouse, WSW. ½ W	28½
Point Judith Lighthouse, W. ¼ S	21½
Brenton Reef Light-vessel, W. ¾ N	16
Sakonnet Lighthouse, WNW. ⅞ W	8¼

Brenton Reef Light-vessel.—The following are bearings and distances from Brenton Reef Light-vessel:

	Miles.
Castle Hill Lighthouse, NNE. ⅝ E	1⅞
Sakonnet Lighthouse, E. ¼ S	7⅞
Cuttyhunk Lighthouse, ESE. ¾ E	19¼
Vineyard Sound Light-vessel, ESE	17¼
NW. point No Mans Land, SE. by E	26½
Block Island (N.) Lighthouse, SW. ¼ W	15
Point Judith Lighthouse, SW. by W. ⅝ W	6¼
Whale Rock Lighthouse, NW. by W. ⅛ W	2¼
Beavertail Lighthouse, NNW. ⅞ W	1½

Nantucket Shoals Light-vessel.—The following are bearings and distances from Nantucket Shoals Light-vessel:

	Miles.
Diamond Shoal Light-vessel, SW. ¼ W	428½
Cape Charles Light-vessel, SW. by W. ½ W	356½
Five Fathom Bank Light-vessel, WSW. ½ W., westerly	255
Fire Island Light-vessel, W. ¾ N., westerly	163¾
Sandy Hook Light-vessel, W. ¾ N., westerly	192¾
Fire Island Lighthouse, W. by N	164½
Montauk Point Lighthouse, NW. by W. ⅝ W	105½
Block Island (SE.) Lighthouse, NW. by W. ⅛ W., westerly	94
Point Judith Lighthouse, NW. ½ W., northerly	95¾
Brenton Reef Light-vessel, NW. ¼ W	93¾
W. End No Mans Land, NW. ⅛ N	67½
Sankaty Head Lighthouse, N. ⅞ W	43¼

STORM WARNING DISPLAY STATIONS.

The storm warning displays of the United States Weather Bureau are made for the benefit of mariners at the following stations. The signals are described and their meaning is explained in Appendix III.

Gloucester, Mass.
Marblehead, Mass.
Boston, Mass.*
Hull, Mass.
Wellfleet, Mass.
Provincetown, Mass.
Race Point, Mass.
Cape Cod (Highland) Light, Mass.
Chatham, Mass.
Monomoy, Mass.
Hyannis, Mass.
Great Point, Mass.
Nantucket, Mass.*
Cross Rip Light-vessel, Mass.
East Chop, Mass.
Nobska Point Light, Mass.
Tarpaulin Cove, Mass.
New Bedford, Mass.
Fall River, Mass.
Newport, R. I.
Saunderstown, R. I.
Narragansett Pier, R. I.*
Point Judith, R. I.
Block Island, R. I.*
Block Island (SE.) Light, R. I.

SEACOAST TELEGRAPH AND REPORTING STATIONS.

The following seacoast reporting stations are maintained, from which passing vessels are reported. Vessels can communicate with the stations at Cape Cod Light and Block Island (SE.) Light by International Code Signals.

Hull, Mass.
Cape Cod Light, Mass.
Chatham, Mass.
Vineyard Haven, Mass.
Point Judith, R. I.
Block Island (SE.) Light, R. I.

* At these stations barometers will be compared with standards.

UNITED STATES LIFE-SAVING STATIONS.

The following list of life-saving stations has been corrected to July 1, 1903. The geographical positions given are approximate and are taken from the Official Register of the service. These stations are furnished with lifeboats, mortars, and all other appliances for affording assistance in cases of shipwreck.*

Name of Station.	State.	Locality.	Approximate Position. Latitude, north.			Longitude, west.		
			°	′	″	°	′	″
Straitsmouth	Mass	½ mile west of Straitsmouth light	42	39	30	70	36	00
Gloucester	Mass	Old House cove, westerly side of harbor, 1½ miles from town.	43	35	30	70	41	10
Nahant	Mass	On the neck, close to Nahant	42	25	45	70	56	00
City Point	Mass	Floating station in Dorchester Bay, Boston Harbor						
Point Allerton	Mass	1 mile west of Point Allerton	42	18	20	70	54	00
North Scituate	Mass	2½ miles south of Minots Ledge light	42	14	00	70	45	30
Fourth Cliff	Mass	South end of Fourth Cliff, Scituate	42	09	30	70	42	10
Brant Rock	Mass	On Green Harbor Point	42	05	30	70	38	40
Gurnet	Mass	4½ miles northeast of Plymouth	42	00	10	70	36	10
Manomet Point	Mass	6½ miles southeast of Plymouth	41	55	30	70	32	40
Wood End	Mass	½ mile east of light	42	01	15	70	11	30
Race Point	Mass	1⅝ miles northeast of Race Point light	42	04	45	70	13	15
Peaked Hill Bars	Mass	2½ miles northeast of Provincetown	42	04	40	70	09	50
High Head	Mass	3½ miles northwest of Cape Cod light	42	03	55	70	06	50
Highland	Mass	⅞ mile northwest of Cape Cod light	42	02	55	70	04	20
Pamet River	Mass	3½ miles south of Cape Cod light	42	00	00	70	01	15
Cahoons Hollow	Mass	2½ miles east of Wellfleet	41	56	45	69	59	05
Nauset	Mass	1½ miles south of Nauset lights	41	50	40	69	56	45
Orleans	Mass	Abreast of Ponchet Island	41	45	35	69	55	55
Old Harbor	Mass	¼ mile north of Chatham Inlet	41	41	45	69	56	00
Chatham	Mass	1½ miles south-southwest of Chatham lights	41	39	10	69	57	10
Monomoy	Mass	2½ miles north of Monomoy light	41	35	25	69	59	10
Monomoy Point	Mass	¾ mile southwest of Monomoy light	41	33	10	70	00	20
Coskata	Mass	2½ miles south of Nantucket (Great Point) light	41	22	00	70	01	15
Surfside	Mass	2½ miles south of the town of Nantucket	41	14	30	70	06	00
Maddequet	Mass	6 miles west of Surfside	41	16	05	70	12	30
Muskeget	Mass	Near west end of Muskeget Island	41	20	20	70	18	50
Gay Head	Mass	Near light	41	21	04	70	50	08
Cuttyhunk	Mass	Near east end Cuttyhunk Island	41	25	25	70	54	45
Brenton Point	R. I.	On Prices Neck	41	26	58	71	20	10
Narragansett Pier	R. I.	Northern part of the town	41	25	45	71	27	20
Point Judith	R. I.	Near light	41	21	40	71	29	00

*Instructions to enable mariners to avail themselves fully of the assistance thus afforded will be sent free of charge upon application to the General Superintendent of the Life-Saving Service, Washington, D. C.

MASSACHUSETTS HUMANE SOCIETY LIFE-SAVING STATIONS.

No. of station.	Locality of Station.	Remarks.
4	Emerson Point, Cape Ann	Lifeboat.
5	Brace Cove, Gloucester	Lifeboat. Hunt gun and apparatus.
6	Rocky Neck, East Gloucester	Lifeboat.
7	Stage Fort, Gloucester	Hunt gun and apparatus. Dory.
9	Baker Island, Salem Harbor	Dory.
10	Marblehead	Lifeboat. Hunt gun and apparatus.
13	Nahant	Lifeboat. Hunt gun and apparatus.
14	Deer Island, Boston Harbor	Lifeboat.
15	Boston Light	Hunt gun and apparatus.
17, 18	Stony Beach, Hull	Lifeboat. Hunt gun and apparatus.
19	Point Allerton	Lifeboat.
20	Nantasket Beach (between Point Allerton and Strawberry Hill).	Large lifeboat and small boat.
21	Nantasket Beach, Sagamore Hill	Lifeboat and dory. Hunt gun and apparatus.
22	Gun Rock Cove, Cohasset	Lifeboat.
23	Pleasant Beach, Cohasset	Lifeboat. Hunt gun and apparatus
25, 25A	Glades, North Scituate	Lifeboat. Hunt gun and apparatus.
26	North Scituate	Lifeboat.
27	Scituate Light	Lifeboat.
28	Scituate	Hunt gun and apparatus.
29	Bass Cove, Scituate	Large and small lifeboats.
30	Third Cliff, Scituate	Lifeboat. Hunt gun and apparatus.
31	Brant Rock	Lifeboat. Hunt gun and apparatus.
32	Manomet	Dory.
33	Barnstable	Lifeboat.
35	Race Point Light	Hunt gun and apparatus.
40	Nauset Harbor	Lifeboat. Hunt gun and apparatus.
41	Nashawena	Hunt gun and apparatus.
42	Cuttyhunk	Lifeboat. Hunt gun and apparatus.
43	Cuttyhunk (middle south side)	Hunt gun and apparatus.
44	Cuttyhunk Light	Lifeboat and dory. Hunt hand gun and apparatus.
50	Nantucket	Lifeboat. Hunt gun and apparatus.
51	Quidnet, Nantucket	Lifeboat. Hunt gun and apparatus.
52	Siasconset, Nantucket	Lifeboat. Hunt gun and apparatus.
54	Forked Ponds, Nantucket	Lifeboat and life dory. Hunt gun and apparatus.
55	Hummock Pond, Nantucket	Lifeboat and dory. Hunt gun and apparatus.
56	Broad Creek, Nantucket	Lifeboat and dory.
57	Tuckernuck, Nantucket	Lifeboat. Hunt gun and apparatus.
58	Cliffs, Nantucket	Lifeboat and dory.
60	Vineyard Haven	Lifeboat. Hunt gun and apparatus.
65	Cape Poge, Marthas Vineyard	Lifeboat and dory. Hunt gun and apparatus.
67	Squibnocket, Marthas Vineyard	Lifeboat. Hunt gun and apparatus.
68	Gay Head, Marthas Vineyard	Lifeboat. Hunt gun and apparatus.
69	Horse Neck Point	Lifeboat.

REMARKS ON APPROACHING OR STANDING ALONG THE COAST BETWEEN CAPE ANN AND POINT JUDITH.

Approaching Massachusetts Bay from sea.—The approach to the coast of Massachusetts north of Cape Cod is through the Gulf of Maine, the body of water lying westward of a line drawn from Cape Cod to Cape Sable. Between these points, and forming the the eastern limit of the gulf, lie Nantucket Shoals, Georges Bank, and Brown Bank, areas over which there is a depth of less than 50 fathoms. Nantucket Shoals and Georges Bank, on account of their many shoal spots and the strong tidal currents setting over them, are a menace to navigators approaching the coast or standing from Canadian ports to New York.

As far as the navigator is concerned Brown Bank need not be avoided; it may even assist, from soundings, to approximately locate a vessel's position.

Georges Bank, for a distance of 70 miles in a general **NE.** and **SW.** direction and a width of about 40 miles, has a general depth of less than 20 fathoms, and numerous scattered spots with depths ranging from 2 to 10 fathoms, among which are *Georges Shoal* and *Cultivator Shoal.* This part of Georges Bank, lying between latitude 41° 05′ N. and 42° 00′ N. and longitude 67° 17′ W. and 68° 35′ W., should be avoided; in heavy weather the sea breaks on the spots with 10 fathoms or less, and strong tide rips are encountered, the latter, however, not always indicating shoal water. The tidal currents have a maximum velocity of about 2 miles per hour over the shoaler parts of the bank; the flood sets northward and ebb

southward, the times of their turning corresponding very nearly with the time of high and low water at Boston.

Vessels passing south of the dangerous part of Georges Bank should not shoal the water to less than 25 fathoms. Approaching this part of the bank from eastward or southward the water shoals gradually. Approaching from westward the depths are irregular and the water shoals abruptly in places to 20 fathoms or less. On the north side of Georges Bank, between longitude 66° 00′ W. and 68° 00′ W., the 100-fathom and 50-fathom curves are but a few miles apart, and when approaching the dangerous part of the bank from northward, 50 fathoms may be taken as a good depth to avoid the shoals.

Nantucket Shoals is the general name of the numerous different broken shoals which lie southeastward of Nantucket Island, and make this one of the most dangerous parts of the coast of the United States for the navigator. These shoals extend 23 miles eastward and 39 miles southeastward from Nantucket Island, are shifting in their nature, and the depths vary from 3 and 4 feet on some to 4 and 5 fathoms on others, while slues with depths of 10 fathoms or more lead between those farthest offshore. The southeasternmost of these shoals (*Phelps Bank*) has a least depth of 10 fathoms. *Asia Rip*, a part of this bank, lies 40 miles **SSE.** ⅝ **E.** from Sankaty Head Lighthouse and 14¼ miles **NE.** by **E.** from Nantucket Shoals Light-vessel, in latitude 40° 47′ 30″ N., longitude 69° 23′ W. *Fishing Rip*, with depths of 4 to 8 fathoms over it, is about 5½ miles long in a **NNE.** ½ **E.** and **SSW.** ½ **W.** direction. The middle of the rip lies 29 miles **SE.** from Sankaty Head Lighthouse, and 25 miles **NNE.** ¾ **E.** from Nantucket Shoals Light-vessel. This rip is on the easterly edge of Nantucket Shoals, and along the eastern edge of the shoals there is a depth of 6¾ fathoms about 5 miles **SSW.**, and spots with 4½ to 7½ fathoms extend for a distance of 19 miles northward from the middle of the rip. The depth between Fishing Rip and Asia Rip is 10 to 27 fathoms. *Davis South Shoal* is near the southwestern part of Nantucket Shoals. It has a least depth of 15 feet, and the middle of the shoal lies 20 miles **S.** ⅛ **E.** from Sankaty Head Lighthouse. Soundings of 5¾ to 8 fathoms will be found for a distance of 8 miles southwestward of the shoal. The broken shoals and rips lying northward of Davis South Shoal and northwestward of Fishing Rip have depths ranging from 3 feet to 5½ fathoms over them. The tidal currents are strong and variable in direction, forming extensive rips and broken water over the shoals. A detailed description of these shoals is given in another part of this volume.

Nantucket Shoals Light-vessel, the leading mark for vessels passing southward of Nantucket Shoals, is moored in 30 fathoms of water off the southern end of the shoals (see table, page 16).

The only outlying dangers in the Gulf of Maine to be avoided by vessels bound to ports in Massachusetts are *Ammen Rock*, with 4 fathoms, and *Sigsbee Rock*, with 5 fathoms. The latter is in latitude 42° 53′ 30″ N. and longitude 69° 54′ 10″ W., and is 4¼ miles **SW.** ½ **W.** from Ammen Rock. These are a part of *Cashe Ledge*, which is about 6½ miles long in a **NNE.** and **SSW.** direction, with depths of 26 to 30 fathoms.

Vessels from ports in northern Europe or the British Provinces and bound to ports in the United States north of Cape Cod, approach the coast passing between Cape Sable and Georges Bank, between latitude 42° 00′ N. and 43° 10′ N. If bound to Boston they cross Brown Bank in about latitude 42° 30′ N. and longitude 65° 50′ W., and from this position a **WNW.** ⅛ **W.** course made good for about 215 miles should lead to Boston Light-vessel.

Vessels approaching the Gulf of Maine from southward, endeavor to make the 50-fathom curve on the southern edge of Georges Bank in latitude 40° 20′ N. and longitude 69° 00′ W.; then stand **N.** by **E.** on soundings of over 30 and less than 50 fathoms for about 50 miles; and then shape a **NNW.** course, taking care to keep in a greater depth than 20 fathoms until the course is laid to sight Cape Cod Lighthouse (this lighthouse and the wireless telegraph skeleton towers about 9 miles southward of it are the most prominent marks on Cape Cod).

The passage across Georges Bank between the easternmost of the Nantucket Shoals and the westernmost shoal spots of Georges Bank, about 30 miles wide, has been called *Great South Channel.*

Or, vessels coming from Cape Hatteras, Chesapeake Bay, Delaware Bay, or New York, make Nantucket Shoals Light-vessel, passing southward of it; then shape a course to pass about 5 miles eastward of Fishing Rip (4 fathoms); and then stand northward and westward, taking care not to shoal the water to less than 20 fathoms until the vessel heads inshore to sight Cape Cod Lighthouse.

Vessels of less than 24 feet draft may, when coming from southward or alongshore, enter the Gulf of Maine through Vineyard and Nantucket Sounds. This route avoids Nantucket Shoals, and is the one followed by vessels in the coasting trade. Gay Head and No Mans Land, at the western entrance to Vineyard Sound, are the landfalls for vessels approaching from sea.

Approaching Vineyard Sound, Buzzards Bay, or Narragansett Bay from sea.—The approach to the above waters in clear weather requires no special caution, as the land, or at night the lights, will be made and recognized in time to fix the vessel's position so as to avoid danger and set a course for the vessel's destination. Vessels from eastward generally sight No Mans Land and pass southward of it (Gay Head Light is partially shut out by No Mans Land between the bearings **N.** ½ **W.** and **N.** by **E.**); those from westward generally sight Montauk Point and Block Island, passing south of the latter.

In thick weather the greatest caution is necessary as soundings can not be depended on for locating the vessel's position, but inside a depth of 30 fathoms the lead must be constantly used to prevent too close an approach to danger. Coming from the vicinity of Nantucket Shoals Light-vessel, a vessel should not shoal the water to less than 15 fathoms, and it is advisable to remain offshore in a depth of over 20 fathoms. Coming from southward, or southwestward, to insure clearing the shoals off Montauk Point and Block Island, the usual route followed by coasting vessels is to stand in for the south shore of Long Island anywhere between Montauk Point and Shinnecock Lighthouse, sounding frequently, until in a depth of 15 to 16 fathoms, when the vessel will be from 3½ to 4½ miles from the beach. An **E.** by **N.** course made good, and keeping the lead in use so as not to shoal the water to less than 15 fathoms. will then lead along the beach at a distance of about 4½ miles and about 5 miles south of Montauk Point Lighthouse. Continuing on the **E.** by **N.** course, the water will gradually deepen to 24 and 26 fathoms, and then begin to shoal again until a depth of 10 to 12 fathoms is struck on the spur, with 12 fathoms or less water, which extends about 5 miles southeastward from Block Island. The distance the vessel should have made in a greater depth than 15 fathoms should be about 13 miles. When the water deepens to more than 15 fathoms, after crossing the spur, and does not again shoal, the vessel will have cleared Block Island. Approaching Block Island from southward, a depth of less than 10 fathoms indicates less than ¾ mile from the shore and the immediate necessity for hauling off.

The *tidal currents* have an estimated velocity of about 1¼ miles between Montauk Point and Block Island, and about 1 mile between Block Island and Gay Head; their greatest velocity is close to Montauk Point and close to Gay Head, where the estimated velocity is 2 to 3 miles. The flood has a general northerly set and the ebb a southerly set of about equal duration.

Standing along the coast between Cape Ann and Point Judith.—The lighthouses and other aids to navigation are sufficiently numerous to enable a stranger to run either at night or the daytime in clear weather. In thick weather it is advisable to haul offshore, or, if in the sounds, to anchor until the weather clears. There are numerous anchorages where a vessel with good ground tackle can ride out any gale. Of these, Provincetown Harbor is the harbor of refuge most frequently used by vessels approaching Massachusetts Bay from seaward. Newport Harbor and Dutch Island Harbor are the best anchorages for vessels approaching the coast from seaward between Gay Head and Block Island.

The navigator when crossing the banks and when approaching the coast should not neglect to take soundings at frequent intervals.

SAILING DIRECTIONS ALONG THE COAST BETWEEN CAPE ANN AND POINT JUDITH.

1. *From a position about 1 mile SE. by E. ½ E. from Cape Ann Lighthouse.—I. Bound into Boston Harbor by the Broad Sound Channels.*—A **SW.** by **W.** course made good for 20¼ miles will lead to a position about ¾ mile northward of the whistling buoy off The Graves. From this buoy follow the directions in section 1 B or 1 C, according to draft, of the sailing directions for Boston Harbor.

Remarks.—The course leads well clear of all dangers. In clear weather the shore northward will be plainly visible and several lighthouses will be seen. The course leads 1⅝ miles S. of Eastern Point Lighthouse and 1¾ miles southward of Halfway Rock (marked by stone beacon) off Salem entrance. Long Island Head Lighthouse should be made a little on the starboard bow and Boston Lighthouse on the port bow.

II. Bound into Boston Harbor by the Main Ship Channel.—Make good a **SW.** ⅝ **W.** course for 22 miles; Narrows Lighthouse should then show just open southward of Boston Lighthouse, bearing *W.*, and the course should be laid about **W.** by **S.** so as to pass nearly ½ mile southward of Boston Lighthouse; then enter as directed in section 2 of the sailing directions for Boston Harbor.

At night.—Follow the directions in the preceding paragraph until Egg Rock Light approaches a *NNW.* bearing. Keep eastward of a line joining Egg Rock and Minots Ledge lights, and enter as directed in section 1 of the sailing directions for Boston Harbor.

Remarks.—The dangers in approaching the entrance are described under section 1 of the sailing directions for Boston Harbor.

On the **SW.** ⅝ **W.** course Outer Brewster, Boston Lighthouse, and Point Allerton will be made a little on the starboard bow. Boston Light-vessel will be made off the port bow, and **Strawberry Hill**, with a high water tower, will be a very little on the port bow. Three-and-a-half Fathom Ledge and Martin Ledge, each marked by a red nun buoy, will be left about ¾ mile on the starboard hand. When Narrows Lighthouse opens southward of Boston Lighthouse, the red nun buoy marking Boston Ledge should be about 1 mile distant on the starboard bow, and Thieves Ledge whistling buoy a little over ¾ mile distant, a little forward of the port beam.

On the **W.** by **S.** course Boston Ledge buoy should be left about ⅝ mile on the starboard hand.

III. Bound to Plymouth Harbor.—A **S.** by **W.** ⅝ **W.** course made good for nearly 38 miles will lead up to the whistling buoy at the entrance, and to a position from which Gurnet Lighthouse will bear *NW.* by *W.* ¼ *W.*, distant about ¾ mile. To enter, proceed as directed in the sailing directions for that harbor.

Remarks.—The **S.** by **W.** ⅝ **W.** course leads well clear of all dangers. **Manomet Hill**, southward of the entrance, will be made ahead and can easily be seen in clear weather for a distance of 20 miles. The **Standish monument** on Captain Hill will be made on the starboard bow and can be seen from a distance of 15 to 18 miles. Gurnet Lighthouse will be made a little on the starboard bow.

IV. Bound to Provincetown Harbor.—A **S.** ⅝ **E.** course made good for 37 miles will lead to a position about 1½ miles *W.* of Race Point Lighthouse, from which follow the directions for entering Provincetown Harbor.

Remarks.—The high water tower in Provincetown will be a prominent mark on the port bow. Race Point is low, and in the daytime the lighthouse can not be seen a great distance. There are no dangers if a vessel passes more than ¼ mile westward of Race Point Lighthouse steering **S.** ⅝ **E.**

V. To abreast Cape Cod Lighthouse.—Make good a **S.** by **E.** ⅞ **E.** course for 42½ miles; Cape Cod Lighthouse should then bear *W.*, distant about 2 miles. From this position, if bound through Nantucket and Vineyard sounds, follow the sailing directions in section 1 or 1 A for those sounds; if bound outside of Nantucket Shoals, proceed as directed in section 2 following.

Remarks.—There are no dangers, but the northeastern side of Cape Cod should not be approached closer than 1 mile. *In thick weather*, keeping in a greater depth than 20 fathoms will insure giving the northeastern side of the cape a berth of 2½ miles.

2. ***From abreast Cape Cod Lighthouse to Nantucket Shoals Light-vessel.***—When 2 miles *E.* of Cape Cod Lighthouse make good a **S.** by **E.** ⅞ **E.** course for 56 miles. Then make good a **S.** by **W.** course for 20 miles, and then make good a **SW.** ¼ **W.** course for 23¾ miles, which should lead up to Nantucket Shoals Light-vessel (see table, page 16), from which follow the directions in section 3, following.

Remarks.—On the **S.** by **E.** ⅞ **E.** course care must be taken not to be set southwestward on to Nantucket Shoals by the current. The course leads about 4 miles eastward of Nauset Beacons and 10 miles eastward of Chatham Lighthouse, and too far eastward of Monomoy, Nantucket, and Sankaty Head lighthouses for them to be visible. No deep-draft vessel should attempt to sight Sankaty Head Lighthouse when eastward or southeastward of it.

The **S.** by **W.** course leads nearly 5 miles eastward of Fishing Rip, which has a least depth of 4 fathoms and is frequently marked by strong tide rips. (See the description of Monomoy and Nantucket shoals.)

The **SW.** ¼ **W.** course leads 2 miles northward of Phelps Bank (least water 10 fathoms), and directly for Nantucket Shoals Light-vessel. The latter can be left on either hand, taking care to clear the marking buoy which is near the light-vessel.

The **soundings** on the sailing lines are very irregular, and are of but little use in determining the position. When rounding Nantucket Shoals in thick and foggy weather, safety may be insured by taking frequent soundings, and hauling offshore when a sounding of less than 25 fathoms is obtained; such a means will, however, take a vessel farther offshore than the sailing lines given above.

3. ***From Nantucket Shoals Light-vessel.***—The bearings and distances on page 24 will assist the mariner in laying a course for points westward of Block Island.

I. Bound into Buzzards Bay.—A **NW. Westerly** course made good for 74 miles will lead up to the whistling buoy from which Gay Head Lighthouse bears *ENE.* ⅞ *E.*, distant 8 miles. From this buoy steer **N.** ½ **E.** about 9½ miles for Hen and Chickens Light-vessel, passing westward of Vineyard Sound Light-vessel. When nearly up to Hen and Chickens Light-vessel follow the sailing directions for Buzzards Bay.

Remarks.—The **NW. Westerly** course leads well clear of all dangers, and passes about 2½ miles southwestward of No Mans Land, where there is a depth of 8¾ fathoms, which is the least water on this course. The ebb current sets southward and flood northward.

II. Bound into Narragansett Bay.—A **NW.** ¼ **W.** course made good for 93¾ miles will lead to Brenton Reef Light-vessel, from which be guided by the sailing directions for entering Narragansett Bay.

Remarks.—The course leads clear of all dangers and about 3½ miles southwestward of No Mans Land. Gay Head, which is prominent and easily recognized (see description), should be about 8 miles distant when on the starboard beam. Gay Head, Cuttyhunk, and Sakonnet lighthouses will be made on the starboard bow, Beavertail ahead, and Point Judith Lighthouse on the port bow.

III. Bound through Block Island Sound to Long Island Sound.—Make good a **NW.** ¾ **W.** course for 96 miles. Point Judith Lighthouse should then bear *NE.* ½ *N.*, distant 4 miles, and Block Island (N.) Lighthouse *SW.* ½ *S.*, distant 5 miles, and the course for Long Island Sound entrance is **W.**

Remarks.—The course leads 10½ miles southwestward of No Mans Land, and Gay Head Lighthouse should be 15 miles distant when on the starboard beam. Beavertail and Point Judith lighthouses will be made on the starboard bow, and Block Island and the lighthouses on it on the port bow.

MASSACHUSETTS BAY*

is the large and deep body of water indenting the eastern shore of Massachusetts, and, for the purpose of this description, may be considered as the waters lying westward of a line joining Cape Ann and Cape Cod. It is about 20 miles wide (**E.** and **W.**) and over 50 miles long (**N.** and **S.**).

*Shown on charts **1000**, Mercator projection, Deg. Lat. = 3.7 inches; **7**, scale $\frac{1}{400,000}$; **109, 110**, scale $\frac{1}{80,000}$, price of each $0.50.

From Cape Ann, the northern point of the bay, the shore extends in a general **SW.** direction for about 20 miles to Nahant Head. That part making farther westward is known as Boston Bay (see description) and extends southward to Minots Ledge (lying about 11 miles **SSE.** from Nahant Head), from which the shore extends in a **S.** by **E.** direction for about 20 miles; southward of this the shore curves eastward and northward, and this part of the bay assumes a semicircular shape and is known as Cape Cod Bay.

On the shores of Massachusetts Bay there are a number of seacoast and harbor lights (see table, pages 12–15), which make navigation of the bay comparatively easy in clear weather.

Bays and harbors.—Within the limits of Massachusetts Bay there are a number of bays and harbors, the most important of which, named in order from Cape Ann westward and southward, are Gloucester Harbor, Marblehead Harbor, Salem Harbor, Nahant Bay, and Boston Bay. Inclosed in the limits of the last-named bay are Broad Sound, Lynn Harbor, Boston Harbor, Hingham Bay, and Cohasset Harbor. Farther southward are Duxbury, Kingston, and Plymouth, and then Cape Cod Bay, with the harbors of Barnstable, Wellfleet, and Provincetown. These harbors are described under separate headings.

Stellwagen Bank, in the entrance to Massachusetts Bay, lies almost exactly in line between Cape Ann and Cape Cod; is about 17½ miles long, 2 miles wide at its northern end, and nearly 8 miles wide at its southern; and has from 9½ to 20 fathoms of water over it. The bank extends in a **N.** and **S.** direction, its northern end being a little over 15 miles southward of Cape Ann Lighthouses, and its southern end 5 miles northward of Race Point. At its southwestern extremity, which is a little over 27 miles southeastward of Boston Lighthouse, is a spot with 9½ fathoms, the shoalest part of the bank; but the general depth over its area is from 12 to 15 fathoms.

Striking the northern part of this bank, in coming from eastward, it will shoal rapidly from 30 to 19 fathoms; crossing the middle of the bank on a **WNW.** course, there will be from 14 to 16 fathoms, "coarse sand and black specks;" and here the bank is a little over 4 miles wide. But in coming from southward and crossing the southwestern end of the bank the soundings will decrease rapidly from 25 to 12 fathoms, "fine sand;" and a least depth of 9½ fathoms may be encountered before leaving the bank.

Pilotage, quarantine, etc.—Extracts from the laws of Massachusetts, relating to pilots, pilotage, harbor control, and quarantine are given in Appendix II.

Storm warning displays of the U. S. Weather Bureau are shown at the places mentioned on page 24, and their meaning explained in Appendix III.

A list of **life-saving stations** is given on pages 25–26.

A list of **lighthouses** is given on pages 12–15.

Tides, see page 11.

Variation of the compass, see page 11.

GLOUCESTER HARBOR*

is the most important fishing port in the United States and an important harbor of refuge; it lies 5 miles southwestward of Emersons Point, the easternmost point of Cape Ann. The entrance is marked on its eastern side by Eastern Point Lighthouse (see table, page 12), which is the principal aid. There is an outer and an inner harbor, the former with a general depth of 5 to 6 fathoms and the latter 2½ to 4 fathoms.

A breakwater is under construction which, when completed, will extend 750 yards in a **NW.** by **W** direction from the shore near Eastern Point Lighthouse; in 1903 there is a red gas-lighted buoy off the end of the incompleted breakwater. The entrance westward of the breakwater is about ⅝ mile wide; but Round Rock Shoal lies nearly ¼ mile westward of the end of the breakwater, leaving a channel 250 yards wide and 3¾ to 4 fathoms deep eastward of the shoal, and ⅝ mile wide and 4¾ to 9 fathoms deep westward of the shoal. During heavy southeast gales the sea, at times, breaks nearly the whole distance across the entrance.

Southeast Harbor is the cove in the eastern part of Gloucester Harbor, northward of Black Bess Point and southward of **Tenpound Island** (marked by a lighthouse, see page 12). It has good anchorage in 4 to 5¼ fathoms.

Western Harbor is the cove, of semicircular shape, in the northern part of Gloucester Harbor, northward of Tenpound Island. It has good anchorage in from 3 to 4½ fathoms, but is not much used. A part of the town of Gloucester is built on its northern shore.

Inner Harbor, the northeastern part of Gloucester Harbor, has many small coves of which no description need be given. It is irregularly shaped, about 1,100 yards long and 600 yards wide, and has a general direction about **NE.** by **E.** and **SW.** by **W.**

*Shown on charts **108, 109,** scale $\frac{1}{80,000}$, price $0.50; **334,** scale $\frac{1}{20,000}$, price $0.20.

The best **anchorage** in the outer harbor for vessels coming in for shelter or bound to Gloucester is Southeast Harbor, which has clay bottom, good holding ground. This portion of the harbor is commonly known as **Pancake Ground.** Fishing nets, marked by buoys, generally occupy the inshore portion of Southeast Harbor in summer. Vessels anchor almost anywhere in the inner harber, but the entrance to Harbor Cove must be left clear.

Wharves.—There are a number of wharves at Gloucester, several of which have depths alongside of 10 to 16 feet. There are several public landings for small vessels; large vessels have to pay wharfage.

Pilots may be found cruising off the entrance to the harbor, and as far eastward as Thatcher Island. A stranger desiring a pilot will obtain one by making signal, and standing off and on outside the entrance. Pilotage is compulsory for certain classes of vessels (see Appendix II).

Towboats can be obtained at the steamboat wharf, and generally go outside to meet large vessels sighted coming in; such vessels are usually towed in and out.

Harbor regulations are given in Appendix II. There are no special harbor dues.

Quarantine regulations are established from time to time by the board of health of Gloucester, and are enforced under the direction of the board.

Marine hospital.—Relief is furnished as provided in the U. S. Public Health and Marine-Hospital Service regulations for stations of class III. The hospital at Chelsea, Mass. (see heading Boston Harbor), is the one to which mariners entitled to hospital treatment are sent from Gloucester (see Appendix IV).

Marine railway.—Gloucester has several marine railways, which are capable of taking out small vessels only, the limit of size being about 200 tons. Boston is the nearest place where large vessels can be docked (see Boston Harbor).

Supplies.—Provisions and ship-chandler's stores can be obtained; also bituminous coal in limited quantities for steamers, put on board either at the coal wharves or by lighters. Fresh water is supplied by water boats or may be taken at the wharves. Most of the tugs working in this harbor carry fresh water to supply shipping.

Storm warning displays of the U. S. Weather Bureau are made at the customhouse, and on Eastern Point near the lighthouse (see Appendix III).

Communication.—Gloucester is on the line of the Boston and Maine Railroad, and has also daily steamboat communication with Boston.

Ice seldom extends outside Tenpound Island, at the entrance to the Inner Harbor. The tugs and steamers keep the Inner Harbor open.

Tides.—The highest tides result when easterly and southeasterly gales occur at full and change. (See table, page 11.)

Tidal currents.—The tidal currents do not to any great degree interfere with the movements of vessels, as they set directly in and out of the harbor, and their velocity is comparatively small. In the narrows, however, between Fort Point and Rocky Neck, the current is stronger, especially at half ebb, and the ebb sets on to Black Rock. Vessels coming out on the ebb favor the northwestern side of the channel in passing between Fort Point and the spindle on this rock. The ebb also sets on to Tenpound Island; the courses given in the sailing directions allow a sufficient berth, and if made good will lead safely by.

SAILING DIRECTIONS, GLOUCESTER HARBOR.

The directions in sections 1, 1 A, and 2 A lead in a least depth of 5 fathoms to the anchorages in the Outer Harbor, and a least depth of 19 feet into the Inner Harbor. Those in section 2 lead in a least depth of 3¾ fathoms eastward of Round Rock Shoal.

1. ***Approaching and Entering, from Northeastward, Eastward, or Southward.***—From a position ½ mile southward of The Londoner, steer **SW.** by **W.** ⅛ **W.** about 5½ miles until up to the red whistling buoy off Eastern Point.

Or, when Eastern Point Lighthouse is made steer for it, taking care, however, to give the shore eastward of the lighthouse a berth of ¼ to ½ mile. As the lighthouse is approached look out for the red whistling buoy lying a little over ½ mile *S.* by *W.* from it; and when the buoy is sighted steer for it and pass close southward of it, and then:

If desiring to pass eastward of Round Rock Shoal, follow the directions in section 2.

If desiring to pass westward of Round Rock Shoal, steer **NW.** ½ **N.** until Tenpound Island bears *NE.* Then steer **NE.** by **N.** until Eastern Point Lighthouse bears *SE.*, and follow the directions in section 2 A.

Remarks.—The **SW.** by **W.** ⅛ **W.** course leads for the whistling buoy off Eastern Point Lighthouse; the latter should be made on the starboard bow, and the shore eastward of the lighthouse should be given a berth of at least ¼ mile.

The **NW.** ½ **N.** course leads nearly 400 yards southward of the black spar buoy on Round Rock Shoal; the black bell buoy off Norman Woe Rock should be made broad off the port bow.

On the **NE.** by **N.** course Round Rock Shoal buoy will be left 300 yards on the starboard hand. In heavy southeasterly gales the sea breaks across the eastern side of the entrance from Eastern Point to Round Rock Shoal.

Dangers.—**The Londoner** is a ledge of rocks a little over ¼ mile long in a **NE.** and **SW.** direction, and 350 yards wide, lying 800 yards **ESE.** from Cape Ann South Lighthouse. Its southern end is dry at low water and is marked by an iron spindle with octagonal cage on top.

Eastern Point Ledge, with depths of 12 to 16 feet, makes off 375 yards southwestward from Eastern Point Lighthouse. It is marked off its end by a buoy (spar, red, No. 2). **Webbers Rock**, with 8 feet over it, is on the end of the ledge, about 200 yards **E.** by **N.** from the buoy.

Dog Bar makes westward from Eastern Point just above the lighthouse; it has 14 to 15 feet over its outer part, with much less toward the shore. The end of the bar is ⅝ mile **NW.** by **W.** from Eastern Point Lighthouse, and its southwestern side is marked by a buoy (spar, red, No. 4) and a gas-lighted buoy, painted red. The breakwater is being built on Dog Bar, and the gas-lighted buoy is off its end.

Round Rock Shoal has 13 to 18 feet over it, is about 250 yards long in a **NE.** by **N.** and **SW.** by **S.** direction, and about 150 yards wide. The shoal lies in the middle of the entrance, ⅝ mile **NW.** by **W.** ½ **W.** from Eastern Point Lighthouse; its southeastern end is marked by a buoy (spar, black, No. 1).

1 A. ***Approaching and Entering, from Southwestward or Westward.***—Bring Eastern Point Lighthouse to bear northward of *NE.* by *E.* and steer for it.

Or, if coming from Salem or Manchester Harbor, bring Baker Island Lighthouse to bear *WSW.* ¾ *W.* and steer **ENE.** ¾ **E.**

As Eastern Point Lighthouse is approached, stand in for the entrance, giving the shore on the port hand a berth of ½ mile, and when the black bell buoy off Norman Woe Rock is made steer so as to pass 400 yards eastward of it. Then steer **NE.** by **N.** until Eastern Point Lighthouse bears *SE.*, and follow the directions in section 2 A.

Remarks.—As the entrance is approached Norman Woe Rock, a dark, irregular-shaped rock with the sea breaking at its base, and lying nearly ¼ mile off the western shore about **W.** by **N.** from Eastern Point Lighthouse, will be seen on the port bow; the black bell buoy lies 400 yards **SE.** from the rock.

The **NE.** by **N.** course leads 300 yards westward of the black spar buoy on Round Rock Shoal, and Tenpound Island Lighthouse will be on the starboard bow.

Dangers.—The dangers southward and eastward of Baker Island are described under the heading Salem Harbor.

Norman Woe Rock, a high and dark, rocky islet, lies about 350 yards from the western shore. Shoal water makes from the rock to the shore; and a shoal with 7 to 16 feet over it extends nearly 300 yards in a **SE.** by **S.** direction, and is marked at its outer limit by a black bell buoy. The long and shallow bight between the rock and the shore from Norman Woe to Muscle Point is known as **Norman Woe Cove.**

Round Rock Shoal is described above.

2. ***From the whistling buoy to an Anchorage, passing Eastward of Round Rock Shoal.***—Passing close southward of the whistling buoy, steer **NNW.** ¼ **W.** until Tenpound Island Lighthouse bears **NE.** by **N.** Then steer for the lighthouse on this bearing, and when Eastern Point Lighthouse bears *SE.*, then:

To anchor in Southeast Harbor.—Steer **NE.** ¼ **E.**, and anchor in 4½ to 5 fathoms when Tenpound Island Lighthouse bears about *N.* by *W.* ½ *W.*

To anchor in Western Harbor.—Steer **N.** by **E.** ½ **E.**, leaving red spar buoys Nos. 6A and 6 about 150 yards on the starboard hand; and when Tenpound Island Lighthouse bears about *E.* ½ *S.*, steer **NE.** by **N.** and anchor over 300 yards from the north shore of the harbor, in 3 to 5 fathoms.

To the Inner Harbor.—Follow the directions in the preceding paragraph until Tenpound Island Lighthouse bears *E.* ½ *S.* Then steer **ENE.**, and leave Babson Ledge buoy on the port hand, and take care to leave the red spindle on Black Rock at least 100 yards on the starboard hand. Continue on the course up the middle of the harbor, and anchor where convenient in the wide part of the harbor below Fivepound Island.

Remarks.—The **NNW.** ¼ **W.** course leads very nearly for the black spar buoy on Round Rock Shoal, and red spar buoys Nos. 2 and 4 are each left 275 yards on the starboard hand.

The **NE.** by **N.** course for Tenpound Island Lighthouse leads fair between the red gas-lighted buoy off the end of the breakwater and the black spar buoy on Round Rock Shoal. Standing for the anchorage in Southeast Harbor, the shore should be given a berth of over 300 yards.

The **N.** by **E.** ½ **E.** course passes westward of the two red spar buoys at Tenpound Island Ledge. Field Rocks buoy (spar, black, No. 3) will be left well on the port hand, and Western Harbor will be ahead.

On the **ENE.** course into the Inner Harbor, care must be taken not to go too close to the shore of Rocky Neck. A number of vessels are usually anchored along the middle of the channel, and it is sometimes close work to pass them.

Dangers.—**Tenpound Island Ledge** is a small ledge with 8 feet over it, lying 700 yards **SW.** ⅝ **W.** from Tenpound Island Lighthouse. It is marked by two spar buoys, one (red, No. 6) on the western edge, the other (red, No. 6A), lying about 150 yards southwestward of the ledge, marks a 16-foot spot.

Field Rocks extend 450 yards from the northern shore of Fresh Water Cove abreast Tenpound Island Ledge; several of them are bare at low water, and their southern end is marked by a buoy (spar, black, No. 3), lying nearly ⅝ mile **W.** by **S.** from Tenpound Island Lighthouse.

A ledge, with 16 feet over its outer end, makes out 200 yards in a **SW.** direction from the southwestern end of Tenpound Island, and there is a depth of 4 feet on the ledge about 100 yards from the island. There is a 15-foot spot about 250 yards **NE.** by **E.** from Tenpound Island Ledge.

Babson Ledge is a small spot, with 14 feet over it, about 500 yards **N.** ¼ **E.** from Tenpound Island Lighthouse, and is marked by a buoy (spar, black, No. 5).

Black Rock, dry at half tide, lies 100 yards from the western end of Rocky Neck, and is marked by a spindle (iron, red, oblong cage on top). Shoal water extends from here southward to the eastern side of Tenpound Island.

Elisha Ledge, dry at low water, lies off the north shore of Rocky Neck, and about **ENE.** from Black Rock spindle. It is marked off its northern side by a buoy (spar, red, No. 8). The ledge lies about halfway between the buoy and the end of the wharf just eastward.

2 A. *To an Anchorage.*—Having followed the directions in section 1 or 1 A, and having Eastern Point Lighthouse bearing *SE.*, distant about ¾ mile:

To Anchor in Southeast Harbor.—Steer **ENE.** and anchor in 4½ to 5 fathoms anywhere southward of Tenpound Island, giving the island a berth of 250 yards, and the shore eastward and southeastward of it a berth of not less than 350 yards.

To Anchor in Western Harbor.—Steer **NE.** by **N.**, leaving the two red spar buoys marking Tenpound Island Ledge 200 to 300 yards on the starboard hand, and Field Rocks buoy (spar, black, No. 3) about the same distance on the port hand. When past these buoys, and northward and westward of Tenpound Island, anchor anywhere westward of Babson Ledge buoy (spar, black, No. 5), but not nearer than 300 yards to the shore, in 3 to 5 fathoms. Light-draft vessels may anchor nearer the shore by using the lead as the northern shore is approached.

To the Inner Harbor.—Follow the directions in the preceding paragraph until Tenpound Island Light-house bears *E.* ½ *S.* Then steer **ENE.**, and leave Babson Ledge buoy on the port hand, and take care to leave the red spindle on Black Rock at least 100 yards on

the starboard hand. Continue on the course up the middle of the harbor, and anchor where convenient in the wide part of the harbor below Fivepound Island.

See the remarks and dangers under section 2, preceding.

MANCHESTER HARBOR*

is about 5 miles westward of Gloucester Harbor, and formed by an arm of the bay extending behind Gales Point in a northeasterly direction for 1 mile to the village of **Manchester**, the entrance being **N.** by **E.** from Baker Island Lighthouses; the approach to it is between **House Island** on the east and **Great Misery Island** on the west. The northern point at the entrance is a high, precipitous head, called **Glass Head**, and between this head and Gales Point the entrance is 600 yards wide. **Proctor Point** is on the eastern shore of Manchester Harbor, ¼ mile above Gales Point, and directly opposite Glass Head, and the harbor here is not quite 200 yards wide.

There is anchorage off the entrance between Great Misery and House islands and the main shore westward of Glass Head. Mariners desiring to anchor for the night or in head winds may here find fair holding ground and good shelter except in southerly gales. The anchorage is ¾ mile wide, and has from 3 to 6 fathoms.

The narrow channel leading up to Manchester from the outer harbor is about 100 feet wide and 6½ feet deep as far as Proctor Point, above which it has 4 to 6 feet in a narrow dredged channel up to the town wharves. The draft of vessels going to Manchester averages about 7 feet, deepest draft about 10 feet.

Pilots are usually taken by strangers bound up to the town, the vessels anchoring in the harbor below until pilots come down in response to signals.

Towboats can be had from Beverly, and are used in towing barges up and down.

Supplies.—Fresh water can be obtained at Manchester; supplies and some ship-chandler's stores from Salem and Beverly. The nearest customhouse is at Gloucester.

Tides.—The mean rise and fall of tides is about 9 feet. See also tidal data for Gloucester and Salem on page 11.

GENERAL DIRECTIONS, MANCHESTER HARBOR.

Approaching and Entering to an Anchorage.—With Baker Island Lighthouses bearing between **WSW.** ½ **W.** and **NW.** by **W.** ½ **W.** steer for them. Pass about ¼ mile northward of Baker Island Lighthouses, and when they bear *S.* ¼ *W.* steer **N.** ¼ **E.**, keeping the bearing. Leave Whaleback spindle on the starboard hand, and Sauli Rock buoy on the port hand.

If intending to anchor in the roads, when well past Sauli Rock buoy steer for Chubb Island (about **NNW.**), and anchor in about 5 fathoms, sandy bottom.

If bound to the village, when the top of the high, wooded hill a little westward of Glass Head bears **N.** by **E.** ½ **E.**, steer for it. Anchor when the center of the southernmost of the two *Ram islands* (which has shrubs and small trees upon it) bears *SE.*, and no attempt should be made to go farther without a pilot.

Remarks.—When heading for Baker Island Lighthouses, as directed, all dangers will be cleared. On the **N.** ¼ **E.** course the spindle on Whaleback should be given a berth of 300 yards, and the buoy on Sauli Rock a berth of about 200 yards. Glass Head will be on the starboard bow and Chubb Island on the port bow.

Chubb Island is a bare, rocky islet lying off the main shore, in the outer roads, about ¾ mile westward of Glass Head.

Dangers.—Off the shore eastward of Manchester Harbor entrance and between Gloucester entrance and House Island are a number of islands, rocks, and ledges, the farthest outlying ones of which, named in order from eastward, are: **Kettle Island, Great Egg Rock, Paddock Rock, Boo-hoo Ledge, Salt Rock, Picketts Ledge, Gales Ledge,** and **Pilgrim Ledge.** The dangers mentioned, with exception of Paddock Rock, Gales Ledge, and Pilgrim Ledge, are bare at low water.

Paddock Rock, small, with 13 feet over it, lies about 600 yards **SW.** by **W.** ½ **W.** from Great Egg Rock, and is not marked.

Gales Ledge, 1 mile **NE.** by **E.** ½ **E.** from Baker Island Lighthouse, is marked by a buoy (spar, red, No. 2) and has a least depth of 5 feet over it. A number of spots with 12 to 17 feet over them lie 600 yards **NE.** by **E.** ½ **E.** from Gales Ledge.

Pilgrim Ledge lies 400 yards **W.** ½ **N.** from Gales Ledge and has 18 feet over it.

The sailing directions lead well clear of these dangers.

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*Shown on charts **109**, scale $\frac{1}{80,000}$, price $0.50; **244**, scale $\frac{1}{20,000}$, price $0.25.

Whaleback is a dangerous ledge lying directly in the passage into the harbor, being less than ¼ mile **SW.** by **S.** from House Island and about ⅜ mile **E.** from Great Misery Island. It is about 400 yards long in a **NNE.** and **SSW.** direction and 75 yards wide, and is bare at low water at the middle and near its northern end. A red iron spindle, with cage on top, marks the ledge near its center.

Sauli Rock lies 300 yards **E.** from the northeastern point of Great Misery Island. It is bare at low water and marked by a buoy (spar, red and black horizontal stripes).

SALEM HARBOR.*

This harbor is at the western end of a large, irregular indentation in the shore of Massachusetts Bay, 11 miles southwestward of Cape Ann, and 12 miles northward and eastward of Boston Harbor entrance. **Gales Point** is the northern, and **Marblehead Neck** the southern, point at the entrance to this large indentation, which includes within its limits the harbors of Manchester, Beverly, Salem, and Marblehead, the distance between the two points being 4 miles. This wide space is studded with islands, bare rocks, and sunken ledges, through which lead the several channels into the harbors.

Salem Harbor is much used as a harbor of refuge, particularly during the autumn. It is especially convenient for vessels seeking shelter bound eastward and met by an easterly gale, as the direction of the harbor is such that a foul wind for proceeding is a fair wind into the harbor, and a fair wind for proceeding is also a fair wind out. Strangers should not attempt to beat into Salem Harbor on account of the numerous ledges and shoals.

Inside of the islands and rocks obstructing the entrance, and southward of the northern shore, there is good anchorage in what may be properly termed the outer harbor. This anchorage ground is about 2 miles long (**E.** and **W.**) and from ½ to 1¼ miles wide (**N.** and **S.**).

The **Inner Harbor,** or Salem Harbor proper, is about 1½ miles long in a **SW.** by **S.** direction. The entrance is between Fort Pickering Lighthouse on the northwest and **Naugus Head,** the northwestern point of Marblehead Peninsula, on the southeast. Between these two points it is 700 yards wide, but it rapidly widens, after passing Naugus Head, to a width of nearly 1 mile. The deep-water channel, 3 to 4 fathoms, is quite narrow and lies nearer the eastern shore. Extensive flats fill the head of the harbor and make off from the western or town side.

South River is a shallow stream only 50 yards wide in places between the wharf lines, and about 7 feet deep in the channel; it separates Salem and South Salem. At the mouth of this stream is **Derby Wharf,** which is nearly 600 yards long in a **SE.** direction, and is marked at its end by **Derby Wharf Lighthouse;** this with Fort Pickering Lighthouse forms a range for approaching the Inner Harbor.

The **City of Salem** has some trade by water. The deepest draft of vessels entering the harbor is 20 feet; there is a depth of 15 feet alongside the coal pier, and about 5 feet alongside Derby Wharf.

Prominent objects.—Approaching from eastward, **Baker Island,** with two lighthouses on its northern end (see table, page 12) and a number of houses scattered over the island, and **Great Misery Island,** the high, bare island, with a clubhouse and water tank near its highest part, lying northward of Baker Island, are the most prominent. Westward of these islands is **Bowditch Ledge beacon,** a large granite beacon with black staff and cage on top. **Hospital Point Lighthouse** (see table, page 12) is on the north shore nearly 3¼ miles **WNW.** from Baker Island Lighthouses, and is the guide for standing in from eastward. On the north side of the entrance to the Inner Harbor is **Fort Pickering Lighthouse.**

Approaching from southward, **Halfway Rock,** a high, solitary rock, with a beacon on it, will be seen about 1⅞ miles south of Baker Island. Southward of Baker Island lie two bare, rocky islets, **North** and **South Gooseberry Islands,** and 1¼ miles **SW.** of these is **Cat Island,** long and narrow with a number of houses near the northern end. Marblehead Neck is high and rocky, and has many summer houses; **Marblehead Lighthouse** (see table, page 12) is on its northern point.

Channels.—Three principal channels lead into Salem Harbor, which are equally good for entering in the daytime in clear weather. These channels come together in the outer harbor, northward of Little Haste, and from there into Salem Harbor proper the depth is 3¼ to 5¼ fathoms.

Main Ship Channel, the most northern channel, has a least depth of over 5 fathoms until up to Little Haste; its entrance lies between Baker Island and Great Misery Island, and its general direction is about **WNW.**

Cat Island Channel, the middle channel, having its entrance near Halfway Rock, leads in a northwesterly direction, between Cat Island on the south and Eagle Island on the north; and has a least depth of 3¼ fathoms when entering between Gooseberry Ledge and Satan Rock, and a least depth of 5 fathoms when entering between Satan Rock and Cat Island.

* See footnote on page 35.

Marblehead Channel, the western channel, leads, in a northerly direction, between Cat Island and Marblehead, and has numerous spots with depths of 19 to 27 feet over them, over which the sea breaks in easterly gales. By avoiding these spots the channel is good for a least depth of about 5 fathoms. It and Cat Island Channel are also channels for approaching the entrance to Marblehead Harbor.

South Channel, a branch from Marblehead Channel, leads along the northern shore of Marblehead Peninsula, and southward of the numerous rocks and ledges lying eastward of the immediate entrance to Salem Harbor, and southward and eastward of the main channel. The South Channel is less than 100 yards wide in its narrowest part and has a depth of 12 feet.

Anchorages.—There is good anchorage in 5 to 7 fathoms westward of Bowditch Ledge and northward or eastward of Little Haste (see description of the harbor preceding); also off the entrance to Beverly Harbor. The quarantine anchorage lies within the following limits: Beginning at Eagle Island and running northwesterly to Coney Island, from Coney Island in a more northerly direction to Great Haste, from there easterly to Bowditch Ledge, and thence southwesterly to Eagle Island. In Salem Harbor the best anchorage is just inside of Naugus Head on the eastern side of the harbor.

Pilots will be found outside of Baker Island. A stranger bound for the port usually takes one, making signal if not spoken, and standing off and on outside until boarded. Pilotage is compulsory for certain classes of vessels in the ports of Massachusetts (see Appendix II).

Towboats can be obtained by making signal after getting in past Baker Island, but are not much used.

Quarantine regulations are established from time to time by the Board of Health of Salem. For anchorage of vessels subject to quarantine, see "Anchorages."

Marine Hospital.—Emergency relief is furnished at Salem, as provided in the U. S. Public Health and Marine-Hospital Service regulations for stations of Class IV (see Appendix IV). The nearest marine hospital is at Chelsea, Mass.

Supplies.—Provisions and some ship-chandler's stores can be obtained. Coal, either anthracite or bituminous, can be obtained at the wharves. Water can be had through hose alongside the wharves, and from a water boat from Beverly.

Repairs.—There is one small marine railway at South Salem, with a cradle 75 feet long. Light repairs to machinery can be made.

Ice.—The head of the harbor on the flats is usually closed by ice every winter during the months of January and February; but the formations rarely extend beyond the coal pier except in unusually severe winters, when they have been known to reach as far out as The Haste, and occasionally as far as Eagle Island.

Northerly and northwesterly winds are most favorable to local formations in Salem Harbor. Winds from southward and westward, during light formations, have a tendency to carry the ice off to sea, while those from **NE.** to **SE.** create a swell which usually breaks up the formations both in the harbor and its approaches.

For **tides** see table, page 11.

The **tidal currents** in Salem have little velocity, and mariners will generally be able to make a course good without regard to tide.

For **variation of the compass** at various points, see page 11.

SAILING DIRECTIONS, SALEM HARBOR.

For depths that can be taken through the several channels into Salem Harbor, see "Channels" on pages 36–37.

1. ***Approaching from Eastward and Entering, by the Main Ship Channel.***—When Baker Island Lighthouses are made, steer for them on any bearing between **WSW. ½ W.** through *W.* to **NW.** by **W. ½ W.** Pass about 450 yards northward of the lighthouses, and steer **WNW. ¼ W.** for Hospital Point Lighthouse; and when Bowditch Ledge beacon bears about *S.*, distant 250 yards, steer **W. ½ N.** until Fort Pickering Lighthouse and Derby Wharf Lighthouse are in range, bearing **SW.** by **W. ¾ W.** Then stand in on this range, and follow the directions in section 2.

At night.—Follow the directions above, and continue on the **WNW. ¼ W.** course for Hospital Point Light until Fort Pickering and Derby Wharf lights are in range. Then

follow the directions in section 2. When on the sailing line for Hospital Point Light, the light will show brighter than if northward or southward of the line. Keep in the brightest rays of that light.

Remarks and dangers.—When standing for Baker Island Lighthouses, **Great Misery Island**, a large, hilly island, with a clubhouse and water tank near its highest part, and **Little Misery**, close southward of Great Misery, will be seen northward of Baker Island. Passing north of Baker Island, leave the black spar buoy (No. 3) off the northern end of Baker Island about 150 yards on the port hand.

Gales Ledge is described on page 35.

Southeast Breakers, with 3 to 17 feet over them, lie about 1¾ miles **SSE.** ½ **E.** from Baker Island Lighthouses, and are marked off the southwestern side by a buoy (nun, red, No. 2); this buoy is numbered and colored for vessels passing into the Cat Island Channel. **Newcombs Ledge**, with 18 feet over it, lies ¼ mile **E.** by **S.** from the southern end of Southeast Breakers.

Middle Breakers, partly bare at low water, lie 1⅝ miles **SSE.** ¾ **E.** from Baker Island Lighthouses, and are marked by a spindle (iron, black ring and pendants on top).

Inner Breakers, parts of which show bare at low water, lie ⅝ mile **WNW.** from the spindle on Middle Breakers. From Inner Breakers a shoal extends northwestward nearly to Baker Island.

Searle Rock, with 8 feet over it, lies about ½ mile **SE.** ¾ **S.** from Baker Island Lighthouses, and is marked off its northern side by a buoy (spar, black, No. 1).

Two spots, with 16 and 18 feet over them, respectively, lie ⅛ mile **NNE.** from the spindle on Middle Breakers, and about 1½ miles **SE.** ½ **E.** from Baker Island Lighthouses. They are avoided by keeping the lighthouses bearing westward of **NW.** by **W.**

Whaleback, marked by a spindle (red cage on top), is described on page 36.

Baker Island Shoal extends northwestward about 300 yards, and westward about 500 yards, from the northern end of Baker Island. The northern end of this shoal is marked by a buoy (spar, black, No. 3).

On the **WNW.** ¼ **W.** course, **Hospital Point Lighthouse**, on the north shore, near the entrance to Beverly Harbor, should be kept ahead. Bowditch Ledge Beacon, a large conical stone beacon surmounted by a black wooden staff and cage, will show prominently on the port bow. The course leads about 300 yards south of Little Misery Island, and over 200 yards north of House Ledge buoy. The buoys westward of Great Misery Island should be left on the starboard hand.

Hardy Rock Shoal, Hardy Rocks, and **Rising States Ledge** lie southward of House Ledge and **W.** from the northern end of Baker Island. They are marked by two spar buoys (black, Nos. 5 and 7) and by a beacon (spar with two triangles on top).

House Ledge has 10 feet over it and lies about ⅝ mile **ESE.** ¼ **E.** from Bowditch Ledge beacon; it is on the south side of the Main Ship Channel and is marked by a buoy (spar, red and black horizontal stripes) placed off its northeastern side.

Bowditch Ledge lies on the south side of the Main Ship Channel about 1⅛ miles **WNW.** from Baker Island Lighthouses; it is marked by a beacon (granite, conical structure, with black wooden staff and cage on top). A shoal spot, with 14 feet, in a surrounding depth of 4 to 5 fathoms, lies 300 yards **ESE.** from the beacon.

Misery Ledge is small, has 17 feet over it, lies on the north side of the Main Ship Channel ¼ mile **N.** by **E.** ¼ **E.** from Bowditch Ledge beacon, and is marked on its southern side by a buoy (spar, red and black horizontal stripes).

John Ledge has 12 feet over it, lies about 300 yards **WNW.** ¼ **W.** from Misery Ledge, and is marked off its southern side by a buoy (spar, red and black horizontal stripes).

Misery Shoal, with 11 feet over it, and **Misery Rock**, with 6 feet over it, lie westward from Great Misery Island and northward and northeastward from Misery Ledge; they are both marked by buoys.

On the **W.** ½ **N.** course Beverly Harbor entrance will be ahead; **Great Haste**, a low, bare, rocky islet, Little Haste beacon, a black oak spar with cask on top, and Haste Shoal buoy will be on the port bow. **Fort Pickering Lighthouse** will be seen on the western side of Salem Harbor entrance, and **Derby Wharf Lighthouse** on the end of the wharf, 1 mile southwestward of it; Derby Wharf Lighthouse is hard to pick up in the daytime, as it is small and about the same color as the buildings showing back of it.

Great Haste is a low, bare, rocky islet surrounded by ledges, and lies 2½ miles **W.** by **N.** from Baker Island Lighthouses, and nearly 1 mile **SSE.** ½ **E.** from Hospital Point Lighthouse.

Little Haste, a rock, bare at low water, lies northwestward of Great Haste, and is marked by a black spar beacon with cask on top.

Haste Shoal makes off nearly 400 yards northward from Little Haste and is marked near its northern end by a buoy (spar, black, No. 11).

A small, shoal spot, with 17 feet over it, lies 300 yards about **N.** by **W.** from buoy No. 11, and on the range of Little Haste beacon and Marblehead Rock beacon. The sailing line leads southward of this shoal.

Haste Rock has 7 feet over it, lies near the eastern end of the ledge making eastward from Great Haste, and is marked off its northern side by a buoy (spar, black, No. 7).

1 A. ***Approaching from Southward or Southeastward and Entering, by the Cat Island Channel.***—When Halfway Rock is made, steer for it on any bearing between **W.** by **S.** (through *W.* and *N.*) and **NE.** by **E.**, and give the rock a berth of from 250 yards to ½ mile. Then bring it to bear *SE.* and steer **NW.** until the north end of Eagle Island is in range with the northern end of Baker Island, bearing *ENE.* ½ *E.*, and Marblehead Lighthouse is on the port beam. Then steer **N.** by **W.** ¾ **W.** until Bowditch Ledge beacon opens south of Little Misery Island and Hospital Point Lighthouse bears **NW.** ¼ **W.** Steer for the lighthouse on that bearing until Fort Pickering Lighthouse and Derby Wharf Lighthouse are in range, bearing **SW.** by **W.** ¾ **W.**, and then follow the directions in section 2.

At night.—Unless the night is clear, so that the buoys can be seen, a stranger should enter by the Main Ship Channel (see section 1).

Remarks and dangers.—Halfway Rock, lying in deep water off the entrance to this channel, is a prominent bare rock rendered conspicuous by a pyramidal frame beacon with stone foundation; on the top of the pyramid is a red keg. The nearest dangers are a little over ¾ mile northeastward, northward, and northwestward from it. **Southeast Breakers** are described under section 1.

On the **NW.** course **Coney Island,** low, bare, rocky islet, will be a little on the port bow; Gooseberry Ledge buoy, Brimbles spindle, Eagle Island, and Mid-channel Rock buoy will be left on the starboard hand in the order named; the latter when abeam should be distant 150 yards. Satan spindle, Cat Island, Martin Rock buoy, and Chappel Ledge buoy will be left on the port hand. The least water liable to be found while on this course is on a small 3¾-fathom spot lying 350 yards **NE.** ¾ **N.** from Satan Rock spindle.

Eagle Island is a small, bare, rocky island about ⅝ mile **NNE.** ¼ **E.** from the northern end of **Cat Island.** The latter island can be readily distinguished by the houses near its northern end; it lies about ⅞ mile **ENE.** from the northern end of Marblehead Neck. Mid-channel Rock buoy (spar, red, No. 4), which lies westward of Eagle Island, should be left at least 125 yards on the starboard hand, when entering.

Davis Ledge, with 12 feet over it, lies 1¼ miles **S.** from Baker Island Lighthouses.

A large shoal, showing dry ledges in places, about 1⅛ miles wide **E.** and **W.**, extends nearly 1 mile southward of Baker Island. The **Inner Breakers** form its southeastern extremity, and near its southern end are the **Dry Breakers,** lying about 400 yards **NNW.** from Davis Ledge. Near its western end are the small islands of North Gooseberry and South Gooseberry.

Gooseberry Ledge is small and has a depth of 15 feet; it lies on the north side of the Cat Island Channel about 1⅛ miles **NW.** ¾ **N.** from Halfway Rock, and is marked by a buoy (spar, red and black horizontal stripes). There are spots with 17 and 18 feet over them eastward and northward of the ledge.

Satan Rock is a small, bare rock marked by a red spindle with black cage on top; it lies about ¼ mile **E.** ½ **S.** from Cat Island beacon, and should be given a berth of 150 yards on its eastern and western sides and 275 yards on its north side.

Martin Rock has 11 feet over it, and lies about 350 yards **E.** from the northern end of Cat Island; it is marked on its eastern side by a buoy (spar, black, No. 1). The eastern shore of Cat Island southward of this buoy should be given a berth of over 200 yards.

The Brimbles are partly bare at low water, and lie nearly ⅜ mile **SE.** by **S.** from Eagle Island on the north side of Cat Island Channel, and are marked by a black spindle (iron, with four arms; the two arms facing the Cat Island Channel are red); the ledge is about 250 yards long in a **N.** and **S.** direction and about 150 yards wide.

Mid-channel Rock has 15 feet over it, and lies about 425 yards **WNW.** ¾ **W.** from the southern end of Eagle Island. It is marked near its southwestern side by a buoy (spar, red, No. 4).

On the **N.** by **W.** ¾ **W.** course Great Haste, a low, bare, rocky islet, and Hospital Point Lighthouse will be on the port bow. Eagle Island Bar buoy (spar, red, No. 6) will be left about 400 yards on the starboard hand, and two black spar buoys will be left well on the port hand.

Chappel Ledge has 16 feet over it, is about 100 yards in diameter, and lies ½ mile **NW.** ¼ **N.** from the northern end of Cat Island and is marked by a buoy (spar, red and black horizontal stripes) placed near its southeastern side. There is a small 19-foot spot about 100 yards eastward of this buoy.

Eagle Bar is an extensive shoal making off for a distance of over ⅝ mile northwestward from Eagle Island. It is marked off its northwestern end by a buoy (spar, red, No. 6).

Coney Ledge, showing a number of bare rocks at low water, makes off southeastward from Coney Island. It is marked near its eastern side by a buoy (spar, black, No. 3).

Coney Island Rock is a detached rock, with 11 feet over it, lying about 300 yards **NE.** ½ **E.** from Coney Island. It is marked at its eastern side by a buoy (spar, black, No. 5).

On the **NW.** ¼ **W.** course for Hospital Point Lighthouse, the buoys and beacon which are left on the port hand should be given a berth of 350 yards or more. Salem Harbor will be open southwestward, and Fort Pickering and Derby Wharf lighthouses will be seen on the western side of the harbor.

Haste Rock, lying about 600 yards **N.** from Coney Island, **Great Haste, Little Haste,** and **Haste Shoal** are described under section 1.

1 B. ***Approaching from Southward or Southwestward and Entering, by the Marblehead Channel.***—At low water and with a swell or heavy sea vessels should follow the directions in paragraph I (see also Marblehead Channel, page 37). At night vessels should not attempt to enter by the Marblehead or South channels.

With Minots Ledge Lighthouse bearing *S.* ¼ *E.* steer **N.** ¼ **W.**

Or, with Boston Lighthouse bearing *SSW.* ¾ *W.* steer **NNE.** ¾ **E.**

Or, with Long Island Head Lighthouse bearing *SW.* ⅜ *W.* steer **NE.** ⅜ **E.**

Or, with Egg Rock Lighthouse bearing *WSW.* ⅝ *W.* steer **ENE.** ⅝ **E.**

Any of the above courses will lead 300 yards south of the red bell buoy just eastward of Outer Breakers, and 1¼ miles *S.* by *W.* ¾ *W.* from Tinker Island.

I. Vessels of 20 feet or less draft at low water.—Leave the bell buoy about 200 yards on the port hand, and steer **NE.** ¾ **N.** for the western end of Baker Island; and when the south end of Marblehead Rock is in range with the north end of Marblehead Neck (Marblehead Lighthouse bearing *NW.*) steer **NNW.** until Marblehead Lighthouse bears abeam (*WSW.*). Then steer **N.** by **E.** ¼ **E.** with the beacon on Marblehead Rock astern, leaving Archer Rock buoy 200 yards on the starboard hand and Chappel Ledge buoy 200 yards on the port hand. Continue the course until Hospital Point Lighthouse bears **NW.** ¼ **W.**, and then steer for it on that bearing until Fort Pickering and Derby Wharf lighthouses are in range, bearing **SW.** by **W.** ¾ **W.** Then follow the directions in section 2.

Remarks and dangers.—On the **NE.** ¾ **N.** course from the bell buoy for the western end of Baker Island, a range should be taken over the western end of the island so as to insure not being set off the course which leads between spots with 3¾ and 4 fathoms over them. On the course, Tinker Island should be left a little over ½ mile distant when it is abeam, and Marblehead Rock and beacon will be on the port bow showing clear of Marblehead Neck. **Tinker Island** is the small, grassy island nearly ⅝ mile **S.** from the southern end of Marblehead Neck. The eastern shore of Tinker Island should not be approached closer than 200 yards, and vessels should not attempt to pass between the island and Marblehead Neck.

Outer Breakers have 8 feet over them, and lie a little over 3 miles **ENE.** ¼ **E.** from Egg Rock Lighthouse, and about 1¼ miles southward of the southern end of Marblehead Neck. They are marked off their southeastern side by a red bell buoy. Northwestward of this buoy lie **Southwest Breakers, Great Pig Rocks, Dolphin Rock, Middle Ground, Sammy Rock, Ram Island, Little Pig Rocks,** and a number of detached rocks with 8 to 15 feet over them, extending in a broken line to the shore. Some of them are marked by buoys which are colored and numbered for vessels bound westward, but no stranger should attempt to pass inside the bell buoy.

Roaring Bull, bare at low water, and marked by a spindle (iron, red, cross on top) lies about 400 yards **SW.** by **S.** from Tinker Island. There is a small detached 16-foot spot about 500 yards **SW.** from the spindle.

Volunteer Rock, with 18 feet over it and not marked, lies a little over ¾ mile **S.** ¼ **W.** from Marblehead Rock beacon, and 850 yards **SE.** by **S.** from the spindle on Tom Moores Rock. This rock is surrounded by depths of 21 to 24 feet.

Tom Moores Rock shows bare at one-third ebb, and lies a little more than 400 yards eastward from the eastern shore of Marblehead Neck, and about ⅓ mile **SSW.** ¾ **W.** from the beacon on Marblehead Rock. It is marked by a spindle (iron, black, cask on top). There is shoal water between the spindle and the shore.

On the **NNW.** course Marblehead Rock is left nearly ¼ mile on the port hand, and when Marblehead Lighthouse is abeam, Archer Rock buoy should be 350 yards distant about one point forward of the starboard beam. The numerous spots with 19 to 27 feet over them are avoided by keeping close on the course.

Marblehead Rock is a high, bare rock surmounted by a beacon painted white and black in horizontal stripes, and lies about 500 yards eastward of the northeastern end of Marblehead Neck.

Lasque Ledge, with 10 feet over it at its end, extends 350 yards in an easterly direction from the northern end of Marblehead Neck, and is marked at its end by a buoy (spar, black, No. 1). A 15-foot spot lies about 100 yards northward of this buoy.

The **N.** by **E.** ¼ **E.** course leads nearly ¼ mile eastward of Grays Rock; and when the latter is nearly abeam, Chappel Ledge buoy should be left 200 yards on the port hand. After passing this buoy vessels may steer **N.** until Hospital Point Lighthouse bears **NW.** ¼ **W.**, when the latter should be steered for.

Archer Rock is a detached rock, with 10 feet over it, lying about 600 yards **W.** by **S.** from the northern end of Cat Island. It is marked off its southern end by a buoy (spar, red and black horizontal stripes).

Ledges and **shoals** make off 350 yards westward and 250 yards northwestward from the northern half of Cat Island. On the ledges making off southward from the island is a beacon (black, spar, with large cask on top). Shoal water extends 150 yards southward of the beacon. About 200 yards **SW.** from this beacon is a detached 16-foot spot.

Chappel Ledge is described under section 1 A, page 39.

Grays Rock is a low, bare, rocky islet surrounded by shoal water for a distance of 125 yards; it lies about ⅛ mile **N.** by **E.** ¼ **E.** from Marblehead Lighthouse. Westward of Grays Rock is the entrance to the South Channel.

Coney Ledge, Coney Island Rock, and **Eagle Bar** are described under section 1 A.

Haste Rock, Great Haste, Little Haste, and Haste Shoal are described on page 38.

II. Vessels of less than 15 feet draft.—Leaving the bell buoy just eastward of Outer Breakers, about 200 yards on the port hand, steer **NNE.** ¼ **E.**; pass ¼ mile eastward of Tinker Island, and the same distance eastward of the spindle on Tom Moores Rock, and when the beacon on Marblehead Rock is on the port beam, distant 300 yards, steer **N.**

When Archer Rock buoy is on the starboard beam, distant 200 yards, steer **N.** by **E.** ¼ **E.** so as to pass 200 yards eastward of Chappel Ledge buoy. When the latter is a little abaft the beam, steer **N.** until Hospital Point Lighthouse bears **NW.** ¼ **W.** Then steer for the lighthouse on this course until Fort Pickering and Derby Wharf lighthouses are in range; then follow the directions in section 2.

Remarks.—Care must be taken not to be set westward when on the **NNE.** ¼ **E.** course. Marblehead Rock is bold on its eastern side, and can be approached on that side as close as 100 yards. Bowditch Ledge beacon should be ahead on this course.

On the **N.** course from Marblehead Rock, Grays Rock will be a little on the port bow, and Chappel Ledge buoy a very little on the starboard bow (nearly ahead).

On the **N.** course, after passing Chappel Ledge buoy, two black spar buoys will be left 300 and 400 yards, respectively, on the port hand.

For dangers, see the dangers under paragraph I, preceding.

2. *To an Anchorage in the Inner Harbor.*—Having followed the directions in section 1, 1 A, or 1 B, steer for Fort Pickering Lighthouse, keeping it in range with Derby Wharf Lighthouse, course **SW.** by **W.** ¾ **W.** When Old Hospital Point, the northern point of Salem Neck, bears *NW.*, and black spar buoy No. 13 is 200 yards distant on the port beam, steer **SW.** ¾ **W.**, passing 200 to 300 yards eastward of Fort Pickering Lighthouse. Continue this course, and anchor southward of Fort Pickering Lighthouse and off the end of the Philadelphia and Reading coal pier, in 3½ to 4½ fathoms, soft bottom.

Remarks.—When standing for Fort Pickering Lighthouse, the beacon on Abbott Rock will be a little on the starboard bow. When the course is changed to **SW.** ¾ **W.**, Middle Ground buoy (spar, black, No. 13) will be left about 200 yards on the port hand. Great Aqua Vitæ beacon, and the buoys marking the South Channel, will be seen on the port hand when nearly up to Fort Pickering Lighthouse. The sailing line leads about midway between Naugus Head and the coal wharf.

Dangers.—The **Middle Ground** extends ⅛ mile **SW.** by **W.** ¾ **W.** from Great Haste to Great Aqua Vitæ Ledge; it is awash in several places at low water, and is marked at its western side by a buoy (spar, black, No. 13).

Abbott Rock shows bare at low water, and lies nearly 600 yards **NE.** ½ **E.** from Fort Pickering Lighthouse; it is marked by a beacon (pyramidal stone structure surmounted by a staff with square red cage on top). A 14-foot shoal lies 300 yards **NE.** from the beacon, and another with 18 feet over it lies the same distance **SSW.** from it.

Great Aqua Vitæ Ledge lies about ⅜ mile **E.** by **S.** from Fort Pickering Lighthouse and at the southwestern end of the Middle Ground, and is marked by a beacon (pyramidal stone structure surmounted by a black staff and cage).

Knapp Rock has 8 feet over it, and lies about 100 yards westward from Great Aqua Vitæ Ledge; it is marked by a buoy (spar, red, No. 10), which is left well on the port hand by vessels entering from northeastward.

Halfside Rock lies nearly 500 yards **W.** by **S.** from Fort Pickering Lighthouse, and is marked off its eastern side by a buoy (spar, red, No. 12).

2 A. *Through the South Channel to the Anchorage.*—Follow the directions in section 1 B, and bring Marblehead Rock to bear *W.*, distant about 200 yards; then steer **N.** by **W.** ½ **W.** with Hospital Point Lighthouse ahead. The spindle on Kettlebottom should be kept a little on the port bow. Pass about 250 yards westward of Grays

Rock, and 100 yards eastward of Kettlebottom spindle (iron, black, with open sphere on top). Then steer **NW. ⅜ N.**, heading so as to pass midway between red spar buoy No. 4 and black spar buoy No. 3. When midway between these buoys, steer **WNW. ⅜ W.**, leaving black spar buoy No. 5 about 50 yards on the port hand, and red spar buoys Nos. 6, 8, and 10 about 100 to 150 yards on the starboard hand. When the latter buoy is a little abaft the beam, steer about **WSW. ½ W.**, and anchor off the end of the Philadelphia and Reading coal pier, in 3½ to 4½ fathoms, soft bottom.

Remarks.—The buoys are the principal guides for this channel; they can be readily followed in the daytime in clear weather, being so close to each other that the next buoy ahead can always be seen.

A detailed description of the dangers on both sides of this channel would be of no practical use; chart No. 244 should be examined to obtain an idea of their number and extent.

BEVERLY HARBOR.*

This small harbor lies north of Salem Neck, at the western end of Salem outer harbor, and is formed by the confluence of **Essex Branch** (locally known as **Danvers River**), **Beverly Creek**, and **North River**, three small streams which unite at this point, forming a basin of irregular shape. On the northern shore of the basin is the town of **Beverly**. The harbor is about ⅝ mile in diameter, full of flats and shoals, but with good water in the channel. It is crossed at its western end by two drawbridges (width of draws, 32½ and 40 feet). Hospital Point Lighthouse is the principal guide to the entrance, which is narrow and full of shoals.

The channel is marked by buoys and beacons; it is very narrow, and has a depth of 18 feet to the wharves. The channel will be widened to 200 feet by dredging its narrowest parts. A stranger should not attempt to enter at low water if drawing over 10 feet. The deepest draft of vessels entering the harbor is about 17 or 18 feet. From 12 to 16 feet of water is found at the ends of the wharves at low water.

The **best anchorage** is between the Middle Ground and Lobster Rocks beacon, or between the bridge and wharves. In going up toward the bridge the best water is near the wharves.

Danversport, about 1½ miles above Beverly, on Danvers River, is at the head of navigation. Vessels of 10 to 12 feet draft are taken up to Danversport.

North Salem, on the North River, is about 1 mile above Beverly. The deepest draft taken to North Salem is 10 to 12 feet.

Pilots can be found off Baker Island, and are generally taken by strangers. A vessel desiring a pilot, and not having been boarded by one off Baker Island, should come to anchor, with signal flying, when past The Haste, and wait for one to come on board. Pilotage is compulsory for certain classes of vessels (see Appendix II).

Towboats are frequently taken by vessels bound to Beverly, and can be had at the wharves, or by signaling for one when approaching the entrance of the harbor.

The **quarantine ground** is the same as for Salem Harbor (see page 37).

Supplies.—Provisions and some ship-chandler's stores can be obtained; also anthracite and bituminous coal in limited quantities, for steamers, put on board alongside wharves or in lighters. Water can be obtained alongside wharves through pipes and hose, and from a water boat.

Marine railway.—There is one marine railway, capable of hauling out vessels of about 500 tons.

Tides.—The mean rise and fall of tides are about the same as at Salem (see table, page 11).

The **tidal current** has considerable velocity, and sets athwart the channel in places; during the first half of the ebb it sets across Monument Bar.

SAILING DIRECTIONS, BEVERLY HARBOR.

Strangers of over 10 feet draft should not enter without a pilot, as the channel is narrow and crooked in places, and, although well marked by aids, requires some local knowledge to keep in the best water. No attempt should be made to enter at night.

Approaching and Entering.—Follow the directions in section 1, 1 A, or 1 B, Sailing Directions, Salem Harbor. When Fort Pickering and Derby Wharf lighthouses are in range, bearing **SW.** by **W. ¾ W.**, steer for them until Little Haste beacon or the northern end of

*See footnote on page 35.

Great Haste bears *SE.* by *E.* ½ *E.* Then steer **NW.** by **W.** ½ **W.**, keeping the beacon or island astern. When Monument Bar beacon (pyramidal stone structure with black staff and square cage on top) is in range with Lobster Rocks beacon (square stone structure), bearing *W.* ¼ *N.* steer about **W.** by **N.** Leave black spar buoy No. 1 about 100 yards on the port hand, and pass about 75 yards northward of Monument Bar beacon.

Round the beacon at this distance and steer about **SSW.**, heading about for Rams Horn beacon, and so as to pass at least 50 yards eastward of red spar buoy No. 4; when abreast this buoy haul a little westward, and pass about 50 yards southward of red spar buoy No. 6. When this buoy is passed steer for Lobster Rocks beacon, course about **NW.** ¼ **W.** When the beacon is about 150 yards distant ahead, haul northward, pass about midway between the beacon and Tuck Point, and anchor off the wharves of the town in 14 to 18 feet water, soft bottom.

Remarks.—On the **NW.** by **W.** ½ **W.** course, Porter Rock buoy (spar, red, No. 2) will be made ahead; this buoy is left on the starboard hand when rounding Monument Bar beacon. There is a pile dolphin on the west side of the channel opposite Monument Bar beacon. The narrowest part of the channel is abreast of red spar buoy No. 4.

Dangers.—**A shoal** extends ¼ mile northward from Old Hospital Point, and nearly that distance westward; the shoal is marked at its northern limit by a buoy (spar, black, No. 1), near its northwestern end by Monument Bar beacon, and on its western side by Rams Horn beacon. There are two small spots, with 12 feet over them, in the middle of the channel, and 150 yards northeastward of black spar buoy No. 1.

A shoal extends ¼ mile in a southeasterly direction from Tuck Point, and from there eastward along the bight (Mackerel Cove) to Woodberry Point; three red spar buoys mark the eastern outer limit of the shoal.

Rams Horn Rock, marked by a square granite beacon, with wooden staff and sugarloaf-shaped top, is on the east side of the channel, and about ¼ mile **SW.** by **S.** from Monument Bar beacon.

Lobster Rocks, a group of rocks, dry at half tide, are on the northeastern point of the flats on the western side of the channel, and are marked by a square granite cribwork beacon 200 yards **SW.** by **W.** ¾ **W.** from Tuck Point.

MARBLEHEAD HARBOR.*

This harbor, about 1 mile long and ⅜ mile wide, lies between Marblehead Neck and Marblehead Peninsula, which forms the southern shore of Salem Harbor. Its southern end is separated from the ocean by **Marblehead Beach,** a narrow strip of land connecting Marblehead Neck with the mainland.

Marblehead Harbor is of comparatively little commercial importance, but is the rendezvous for yachts while cruising in eastern waters. The Eastern Yacht Club has a large clubhouse here. Vessels of 20 feet draft can enter the harbor at mean low water; strangers of deeper draft should take a pilot. There is 8 to 11 feet alongside the wharves. The deep water extends close to the eastern and western sides of the harbor, but shoals cover the greater part of its head southward of Skinners Head and Boden Point.

The town of **Marblehead** occupies the northwestern shore of the harbor, and is connected with Salem by a railroad.

The entrance, about ⅜ mile wide, is between Marblehead Point on the southeast and Fort Sewall on the northwest. **Fort Sewall** is on the eastern side of Marblehead Peninsula eastward of the town, but is not so conspicuous as the cottages and summer houses a little back from it. **Marblehead Point** is the northern end of Marblehead Neck, and is marked by **Marblehead Lighthouse** (see table, page 12).

The anchorage is anywhere in the middle of the harbor in 18 to 30 feet of water, good holding ground, and is sheltered from all but northeasterly winds; with good ground tackle vessels have no difficulty in riding out a northeaster.

Pilots.—Strangers sometimes take a pilot, making a signal when off Marblehead Neck, and standing off and on until a branch pilot comes on board. Pilotage is compulsory for certain classes of vessels (see Appendix II).

Towboats are not generally used, but can be obtained from Beverly, Boston, or Gloucester in case of necessity.

Quarantine regulations are established by the local board of health and enforced under the direction of the board. Vessels subject to quarantine are not permitted to come inside of Fort Sewall until boarded by a health officer.

The nearest **marine hospital** is at Chelsea, Mass. (see Appendix IV).

Supplies.—Provisions can be had in Marblehead; water can be obtained from water boats.

See footnote on page 35.

Storm warning displays of the United States Weather Bureau are made at Marblehead, and can be readily seen by vessels in the harbor.

Ice.—This harbor is rarely obstructed by ice to such an extent as to become a hindrance to navigation. Fishermen have made it a refuge when it was impossible to get into Gloucester, Salem, or Lynn harbors. The formation of ice in Marblehead Harbor is entirely local, and remains but a short time (see ice, Salem Harbor).

Tidal data for this harbor is practically the same as for Salem Harbor (see page 11).

The **tidal currents** are weak, and do not interfere with navigation.

SAILING DIRECTIONS, MARBLEHEAD HARBOR.

1. ***Approaching and Entering, from Northeastward passing north of Baker Island.***—Follow the directions in section 1, Sailing Directions, Salem Harbor, and pass about 150 yards northward of the black spar buoy (No. 3) on Baker Island Shoal, steering **WNW. ¼ W.** for Hospital Point Lighthouse. When the eastern end of Great Misery Island bears *N. ½ E.*, steer **SW. ½ W.** Leave Hardy Rock buoy (spar, black, No. 5) and Hardy Rock beacon (spar, black, with two triangles on top) about 250 yards on the starboard hand. When midway between Eagle Island and the spindle on The Brimbles, steer **WSW.**, giving the north end of Cat Island a berth of 450 yards. Pass about midway between Marblehead Lighthouse and Fort Sewall and head up the middle of the harbor; anchor off the town on the western side of the harbor in 4 to 4½ fathoms water, soft bottom.

Remarks.—On the **SW. ¼ W.** course **Eagle Island**, a low, bare, rocky islet, and Marblehead Lighthouse will be on the starboard bow, and Cat Island on the port bow; the course leads about 300 yards southeastward of Eagle Island.

The **WSW.** course leads northward of Cat Island, about midway between it and Chappel Ledge buoy, and fair into the entrance of the harbor. When past the northern end of Cat Island, Archer Rock buoy will be left 300 yards on the port hand; Lasque Ledge and Gordon Rock buoys will also be left on the port hand, and care should be taken to avoid the 15 and 16 foot spots about 100 yards northward of these buoys.

Dangers.—**Baker Island Shoal, Hardy Rock Shoal,** and **Hardy Rocks** are described on page 38.

Pope Head Shoal lies ¼ mile **WSW.** from the southwestern end of Baker Island. **Popes Head,** two bare rocks, are in the middle of the shoal. The western end of the shoal has 12 feet over it, and is marked by a buoy (spar, black, No. 1).

Cutthroat Ledge has 6 feet over it, lies ⅜ mile **NE. ¼ N.** from Eagle Island, and is marked at its northern side by a buoy (spar, black, No. 9). There are several spots with 17 and 18 feet of water lying about 400 yards **SE. ¼ S.** from Cutthroat Ledge buoy.

Shoals extend northeastward from Eagle Island to Cutthroat Ledge, and also 160 yards eastward from the island.

The Brimbles, Mid-channel Rock, Martin Rock, and **Chappel Ledge** are described on page 39.

Archer Rock and **Lasque Ledge** are described on page 40.

Gordon Rock has 6 feet over it, and lies about 120 yards northward from Marblehead Lighthouse; northward of the rock is a buoy (spar, black, No. 3). A 16-foot spot lies about 250 yards **N.** by **E. ¼ E.** from Marblehead Lighthouse.

Boden Rock, with 9 feet over it, lies about 150 yards from **Boden Point,** near the eastern shore of the harbor, a little more than ¼ mile inside of Marblehead Lighthouse. A buoy (spar, black, No. 5) is placed westward of the rock; vessels should not pass eastward of it. There is a 10-foot spot about 40 yards northeastward of the buoy.

1 A. ***Approaching and Entering, from Southwestward and Southward.***—Follow the directions in section 1 A, page 39, for entering Salem Harbor by Cat Island Channel. When about midway between Eagle Island and the northern end of Cat Island, haul westward and bring Fort Sewall to bear **WSW. ½ W.** and steer for it on that bearing. When well clear of Cat Island, and Grays Rock bears abeam, distant nearly ⅝ mile, steer **SW.** by **W. ½ W.** and anchor off the town as directed in section 1 preceding.

Or, follow the directions in section 1 B, page 40, for entering Salem Harbor by Marblehead Channel. When the beacon on Marblehead Rock bears *SW.*, distant about 250 yards, steer **NW.** by **N.**, and round the northern end of Marblehead Neck, giving it a berth of over 300 yards; when the lighthouse bears *SE.*, steer **WSW.** and anchor as directed in section 1 preceding.

Remarks.—The **WSW. ½ W.** course leads fair between the northern end of Cat Island and Chappel Ledge buoy, and nearly ¼ mile northward of Archer Rock buoy. Marblehead Lighthouse will be on the port bow.

In entering the harbor on the **SW.** by **W. ½ W.** course, pass about midway between Fort Sewall and Marblehead Lighthouse. Boden Rock buoy will be on the port bow.

On the **NW.** by **N.** course from Marblehead Rock beacon, Lasque Ledge buoy will be left over 200 yards on the port hand; and when the course is changed to **WSW.**, Gordon Rock buoy will bear eastward of the line to the lighthouse.

Dangers.—**Lasque Ledge** is described on page 40. **Gordon Rock** and **Boden Rock** are described under section 1.

NAHANT BAY.*

The coast from Marblehead Neck to Nahant Bay is irregular both in direction and appearance.

From **Flying Point**, the southwestern extremity of Marblehead Neck, to **Phillips Point**, the northern point at entrance to Nahant Bay, the direction is **WSW.** and the distance 2¾ miles; but the shore between these two points curves northward and then westward, thus forming a wide cove or bay. In this cove, and off its entrance, are a number of rocks, shoals, and ledges (see description under section 1, Sailing Directions, Nahant Bay). **Ram Island** is a rocky islet lying about ¼ mile from the shore, and about midway between Flying Point and Phillips Point.

Marblehead Beach extends from Marblehead Neck about **W. ½ N.** for ⅝ mile. It is a narrow sand beach, which separates Marblehead Harbor from the sea, and the town is plainly visible over it. At the western end of Marblehead Beach begin the hills, which come abruptly down to the water's edge and are from 50 to 100 feet high. The high land continues in a **WSW.** direction for 1 mile to the eastern end of **Phillips Beach.** This beach has a general course of **SW.** for about ⅞ mile, and for half its length stretches at the foot of a low cliff (about 20 feet high). For the rest of the distance to Phillips Point the land behind the beach is quite low and flat, but high, wooded lands are visible in the distance.

Phillips Point is a high, rocky point, the eastern half of which is from 50 to 60 feet high, mostly cleared, and presents a somewhat precipitous face. The western half is about 80 feet high, and is thickly wooded.

Along the shore from Marblehead to Nahant numerous large cottages will be seen.

Nahant Bay is one of the smaller subdivisions of Massachusetts Bay and is nearly circular in form. It is contained between Phillips Point on the north and the so-called island of Nahant on the south. Between these two points the bay is 2½ miles wide, and about 2 miles long to **Lynn Beach**, which separates it from Lynn Harbor, in Boston Bay. The village of **Swampscott** is situated on the northern shore of the bay, about ¾ mile **W.** from Phillips Point, and the eastern part of the town of Lynn occupies a portion of the northwestern shore of the bay.

Fishing Point, the first headland on the northern shore westward of Phillips Point, is a low but prominent rocky point on which is a large hotel. From it numerous houses dot the beach around to Lynn.

Lynn Beach is a narrow strip of sand separating Nahant Bay from Lynn Harbor. It extends in a **S.** by **W.** direction a little over 1 mile to a high, bluff, rocky head, called **Little Nahant**, the eastern face of which is bold and steep, and is known as **Little Nahant East Point.** On the south, Little Nahant is connected with Nahant by a strip of beach nearly ¼ mile long, called **Little Nahant Beach.**

Nahant lies nearly **E.** and **W.**, and is very irregular in shape. It is a high, rocky peninsula, with a precipitous face eastward. It is occupied by a town which is mainly composed of summer cottages. Its eastern extremity is called **East Point.** Nahant is a great summer resort, and steamers ply regularly between it and Boston during the season. The landings are on the south and west sides. The large cove formed by the curve of the southern shore is sometimes called **Nahant Harbor.**

Seven-eighths mile **NNE.** from East Point is a bold, rocky islet, 60 feet high, called **Egg Rock**, on which is **Egg Rock Lighthouse** (see table, page 12).

For **tidal data**, see tides for Boston Lighthouse in table on page 11.

SAILING DIRECTIONS, NAHANT BAY, TO AN ANCHORAGE OFF SWAMPSCOTT.

This anchorage, in 3 to 6 fathoms, is exposed to winds from eastward and southward, and is seldom used except by yachts in summer. No stranger should attempt to pass between the rocks and ledges lying between Tinker Island and Phillips Point.

*Shown on charts **109**, scale $\frac{1}{80,000}$; **337**, scale $\frac{1}{40,000}$, price of each $0.50.

1. ***Approaching and Entering, from Eastward.***—When 4 miles eastward of Egg Rock Lighthouse, bring it to bear **W.** by **S.**, or westward of this bearing, and steer for the lighthouse. When the lighthouse is 2 miles distant ahead, haul northward, course about **WNW.**, and when Egg Rock Lighthouse bears *S.* by *E.*, steer **N.** by **W.** Anchor in about 5 fathoms when Dread Ledge spindle bears about *E.* by *S.*; Fishing Point will then bear about *NE.* distant ⅜ mile.

Vessels of light draft can find good anchorage in 8 to 15 feet of water westward of Fishing Point, giving the northern shore a berth of not less than 400 yards.

Remarks.—On the **W.** by **S.** course the bell buoy near the Outer Breakers will be left about ⅜ mile on the starboard hand, and two red nun buoys southward of Great Pig Rocks will be left well on the starboard hand.

On the **WNW.** course into the bay, Dread Ledge spindle will be made on the starboard bow; the sailing line leads over ¼ mile southward of it.

Dangers.—**Tinker Island, Roaring Bull,** and **Outer Breakers** are described on page 40.

Great Pig Rocks, a group of bare rocks, surrounded by shoal water, lie 1¼ miles **SW.** ¼ **W.** from Tinker Island.

Southern Shoal Rock, a ledge awash at low water and marked by a buoy (nun, red, No. 6), lies 300 yards **SE.** by **S.** from Great Pig Rocks.

Southwest Breakers, a detached shoal with a rock awash at low water, lies about 300 yards **SW.** from Great Pig Rocks. It is marked by a buoy (nun, red, No. 8).

Middle Ground is a sunken ledge with 5 to 17 feet over it, lying ½ mile **NNW.** from Great Pig Rocks and about 400 yards **SSE.** from Ram Island. A buoy (spar, red, No. 4) marks the ledge at its southeastern end.

Eight-Foot Spot, marked by a buoy (spar, red and black horizontal stripes), lies about midway between Great Pig Rocks and Middle Ground.

Sammy Rock, with 3 feet over it, lies nearly ⅜ mile **W.** ½ **N.** from Middle Ground buoy, and is marked by a buoy (spar, red, No. 6).

Dolphin Rock has 6 feet over it, and lies ½ mile **NW.** by **W.** ½ **W.** from Great Pig Rocks. It is marked by a buoy (spar, red, No. 10).

There are a number of **detached rocks** with 12 to 18 feet over them lying eastward of the above-mentioned rocks and ledges.

Dread Ledge is a bare rock which lies nearly ¼ mile off the southwestern side of Phillips Point. It is marked by an iron spindle with a red cask on top.

1 A. ***Approaching and Entering, from Southward.***—Steer for Egg Rock Lighthouse on any bearing westward of **N.** by **W.** ½ **W.**, and pass ¼ to ½ mile eastward of Egg Rock. Then bring the lighthouse to bear *S.* by *E.* and steer **N.** by **W.**, and anchor as directed in section 1.

If coming from westward, give the southeastern shore of Nahant a berth of at least ½ mile. When Egg Rock Lighthouse bears **N.** steer for it; pass 250 yards westward of Egg Rock; continue the **N.** course and come to anchor off Fishing Point in 4 to 6 fathoms of water.

Remarks.—In coming from westward, care should be taken to avoid Flip Rock, in Broad Sound (see page 47). When past East Point of Nahant the course should be shaped so as to lead 250 yards westward of Egg Rock.

Dangers.—**Shag Rocks** are a group of bare rocks lying nearly ⅜ mile **SW.** from East Point and about 300 yards from the southern point of Nahant. There is a rock, nearly bare at low water, about 80 yards southward of the southernmost Shag Rock.

A **19-foot spot** lies 700 yards **S.** ½ **E.** from Egg Rock Lighthouse, and about ⅝ mile **NE.** ¼ **N.** from East Point.

An **8-foot spot** lies nearly ⅛ mile **WSW.** from Egg Rock Lighthouse, and 400 yards from the shore of Nahant.

BOSTON BAY,*

situated at the western end of Massachusetts Bay, is included between Nahant Head on the north and Strawberry Point, the northern point of Scituate Neck, on the south. Between these limits the distance is about 11½ miles. The northwestern part of the bay is called **Broad Sound.** The principal harbor in the bay is Boston Harbor. It also includes the subordinate harbors of Lynn, Neponset, Weymouth, Hingham, and Cohasset.

*Shown on charts **109**, scale $\frac{1}{80,000}$; **337**, scale $\frac{1}{40,000}$, price of each $0.50. See also footnote on page 9.

The shore of the bay is very irregular, and the western part, Boston Entrance and Harbor, is studded with islands, rocks, and shoals, which are described in connection with that and adjoining harbors.

A table of lighthouses will be found on pages 12–21, which gives the characteristics of the coast and harbor lights from Cape Ann to Point Judith.

Lists of the **life-saving stations** maintained between Cape Ann and Point Judith are given on pages 25–26.

Extracts from the laws of Massachusetts, relating to **pilots** and **pilotage, harbors,** and **quarantine,** are given in Appendix II.

Storm warning displays of the U. S. Weather Bureau are made on the coast at the points named in the list on page 24. An explanation of the use and meaning of these displays is given in Appendix III.

BROAD SOUND,

the northwestern portion of Boston Bay, is about 5 miles wide between Deer Island and Nahant, and nearly 3½ miles long. At the head of the sound is Lynn Harbor, the entrance to which is between **Bass Point** (on Nahant) and Revere Beach. On the east, Broad Sound is separated from Nahant Bay by Lynn Beach, Little Nahant, and Nahant; and its northern shores are occupied by the city of **Lynn,** one of the great manufacturing cities of New England. On the northwest is **Revere Beach,** at the northern extremity of which is a thinly wooded point known as **Point of Pines.**

Deer Island, which separates the entrance to Broad Sound from Boston Harbor, lies **NNW.** and **SSE.,** is nearly 1 mile long, and ¼ mile wide at its widest part. To a vessel approaching from northeastward it will appear as a long, bare island with a gently sloping, green hill, which appears joined to another to the westward, which has a precipitous descent seaward. A large brick building, with a high cupola, is on the western end, and a flagstaff is on the highest part, of the island. On the spit (dry at low water) at the southern end of the island is **Deer Island Lighthouse** (see page 14).

On the north a channel less than 80 yards wide and 9 feet deep separates Deer Island from a low, sandy point of the mainland called **Point Shirley.** This passage is known as **Shirley Gut,** and is used by the steamers plying between Boston and Nahant.

Point Shirley is the southwestern extremity of a very long and narrow peninsula, mostly sand beach, which extends in a **S. ¼ W.** direction from the mainland southward of Revere Beach. The point itself forms a sort of flat head to this peninsula.

Winthrop Head, a precipitous headland 100 feet high with many houses on its northern side, is situated ¼ mile **NNE.** from Point Shirley and on the western side of the entrance to Broad Sound. From this head a sand beach extends about 1 mile northward to **Grover Cliff,** which shows bare, yellow, precipitous faces, about 80 feet high eastward, and is the most prominent between Point Allerton and Nahant Head.

Broad Sound has good water, the depth ranging from 4½ to 7 fathoms, but from the western shore shoals make off a long distance. Between Winthrop Head and Grover Cliff shoals extend out ¼ to ⅜ mile, and northward of Grover Cliff the 18-foot curve runs northward for 1⅝ miles and then east to **Bass Point** (the western point of Nahant).

Flip Rock, with 13 feet over it, and surrounded by a depth of 6 to 10 fathoms, is the principal outlying danger. It lies 4 miles **NNE. ¼ E.** from Deer Island Lighthouse and is marked by a buoy (spar, red and black horizontal stripes).

LYNN HARBOR.*

On the northern side of Broad Sound are situated the harbor and city of **Lynn.** The land is low and marshy from the northern bank of Saugus River across the head of the harbor, and it is also much cut up by coves and slues penetrating the marshes in every direction.

The entrance is between Revere Beach on the west and Bass Point, the western point of Nahant, on the east. It is 2 miles wide, but it is so full of rocks and shoals as to leave only very narrow and shallow channels of approach, which have, however, been improved by dredging.

The city of **Lynn** occupies the northern shore of the harbor. On the south and southwest the city is bounded by extensive salt marshes, which extend from ¼ mile to 1¼ miles back from the shore. On the southwest these marshes extend to **Saugus River,** which empties into Lynn Harbor between Tree Point on the north and Point of Pines on the south. The entrance to this river is ¼ mile wide, but the channel is very narrow and the best water is close to Point of Pines. About 4 feet at mean low water may be carried up to the bridge of the Eastern Railroad.

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*See footnote on page 46.

Channel.—A dredged channel 200 feet wide and 10 feet deep leads up to the city wharves at Lynn. Occasional dredging is required to maintain this width and depth. The entrance to this channel is about 1 mile **NW.** from Bass Point, and is marked by a number of buoys and by **White Rocks beacon light**; and the channel is marked by several beacon lights.

Wharves.—A draft of 10 feet can be carried to some of the wharves in Lynn, at mean low water.

Pilots are to be found off Nahant, in Broad Sound, and are generally taken by vessels bound to Lynn. Strangers should never attempt the channel without a pilot. Sailing vessels generally take a towboat. (See Appendix II.)

The **marine hospital**, at Chelsea, is available for mariners entitled to hospital treatment.

Supplies.—Coal, wood, water, and general stores can be obtained at the wharves.

Ice forms in the harbor in severe weather, but it does not endanger vessels.

Tidal data is about the same as for the Navy Yard, Boston (see page 11).

The **tidal currents** set in the general direction of the channel and have considerable velocity during part of the ebb.

SAILING DIRECTIONS, LYNN HARBOR.

These directions lead to the entrance to the dredged channel, above which no stranger should go without a pilot.

1. ***Approaching from Eastward.***—Keep the southeastern end of Nahant bearing westward of *SW.* by *W.* ¾ *W.*, and steer so as to pass about ½ mile southward of Nahant, and when Egg Rock is in range with East Point of Nahant, steer **WNW.** ½ **W.** When Bass Point bears *N.*, distant about ½ mile, steer **NW.** and anchor in 3½ to 4 fathoms, or stand off and on with signal set until boarded by a pilot.

Remarks.—The **WNW.** ½ **W.** course leads ¼ mile south of the red buoy on Joe Beach Ledge, ⅜ mile south of the spindle on Bass Rock, and ¼ mile north of Flip Rock. The steamboat landing at Nahant will be seen northward. The entrance to Nahant Harbor is between Joe Beach Ledge buoy and Bass Rock spindle (see dangers, following); vessels may stand in between the two and anchor southwestward of the landing in 4 to 4½ fathoms of water.

On the **NW.** course the buoys marking the channel to Lynn will be on the starboard bow; the water shoals gradually on the course, and on approaching Revere Beach.

Dangers.—**Shag Rocks** are described on page 46.

Flip Rock is a small, detached ledge, with 13 feet over it, lying nearly 1⅝ miles **SW.** by **W.** ¼ **W.** from East Point of Nahant; it is marked by a buoy (spar, red and black horizontal stripes).

Bass Rock is bare at half tide, with shoal water around it, and lies nearly in the middle of the entrance to Nahant Harbor, about ⅝ mile **SE.** by **E.** ¼ **E.** from Bass Point. It is marked by a spindle (iron, with cage on top, red). A stranger should not pass between Nahant and the spindle.

Joe Beach Ledge, with 2 feet over it, lies nearly ½ mile **E.** ½ **N.** from the spindle on Bass Rock, and 250 to 400 yards from shore. It is marked near its southwestern end by a buoy (spar, red, No. 2).

A spot with 15 feet over it lies about 250 yards **W.** from Bass Point, and a small 18-foot spot lies ⅓ mile **SW.** ½ **W.** from Bass Point.

1 A. ***Approaching from Southward.***—From a position ¾ mile eastward of Minots Ledge Lighthouse steer **NNW.** ¼ **W.** for 7½ miles to a position about ½ mile eastward of the whistling buoy off The Graves. Then steer about **NW.** ¼ **W.** so as to pass about ¼ mile southwestward of Bass Point, the southwestern point of Nahant. Anchor when Bass Point bears *E.*, or stand off and on for a pilot, keeping Bass Point bearing northward of *E.*

Remarks.—On the **NNW.** ¼ **W.** course Egg Rock Lighthouse should be a very little on the starboard bow, and East Point of Nahant a very little on the port bow; and the course if made good leads well clear of all dangers.

On the **NW.** ¼ **W.** course a sharp lookout should be kept for Flip Rock buoy, which can be left 250 yards on either hand (see the dangers under section 1, preceding).

1 B. *Approaching from Boston Harbor.*—Stand out through the Broad Sound South Channel and when 350 yards northwestward of Commissioner Ledge buoy (can, black, No. 1) steer **N.** by **W.** ½ **W.** and anchor as directed in section 1. See the remarks and dangers in the two preceding sections.

BOSTON ENTRANCE AND HARBOR.*

The entrance to Boston Harbor, between Point Shirley on the north and Point Allerton on the south, is about 4¾ miles wide, but is full of islands and shoals between which several channels (see channels) lead into the harbor.

Point Shirley and Deer Island are described on page 47.

Point Allerton, a conspicuous headland, is a bare hill 115 feet high, presenting a steep, waterworn, cliff-like face eastward. The summit is grassy and many houses will be seen on its slopes, and the base of the sea face is protected by a sea wall of granite.

About 1 mile southward of Point Allerton is quite a prominent hill called **Strawberry Hill,** on the top of which is a dark, round water tower, which shows prominently from all directions and is the most prominent landmark in approaching the main channel entrance.

Nantasket Hill lies nearly 1 mile westward of Point Allerton, and is 100 feet high, with an old earthwork and standpipe on its summit. The town of **Hull** is on the lower hill southwestward of Nantasket Hill. **Storm warning displays** of the U. S. Weather Bureau are made on Nantasket Hill.

Outer Brewster, the easternmost of the group of islands at the entrance to Boston Harbor, and lying about 2 miles **N.** by **E.** from Point Allerton, is prominent when approaching from eastward. It is a bare, rocky island 60 feet high, presents a very rugged appearance, and its shores are comparatively bold.

Middle Brewster, a mass of rock about 50 feet high, lies about 300 yards westward of Outer Brewster, and is somewhat less rugged in appearance. A narrow, dangerous passage, called **Flying Place,** separates the two.

Lighthouse Island, a low, rocky islet of irregular shape, lying about ¼ mile **SSW.** from Middle Brewster, is on the north side of the Main Ship Channel, and on it is **Boston Lighthouse** (see table, page 12), with its accompanying dwelling and fog-signal houses.

Great Brewster, about 800 yards **NNW.** from Lighthouse Island (with which it is connected by a long gravel spit, bare at low water), is about 100 feet high, and presents a precipitous face seaward. Its very remarkable shape renders it a landmark not to be mistaken. The sea face is a precipitous waterworn cliff, the base of which is protected by a sea wall. The summit is smooth and grassy, but bare of trees. From the southwestern end of Great Brewster, a long, dry, sand spit or bar extends westward for 1 mile to The Narrows. This is called **Great Brewster Spit,** and on its end is **Narrows Lighthouse** (see table, page 12).

Calf Island, lying about ¼ mile northward of Great Brewster, is a grassy island about 30 feet high.

Little Calf Island, about 100 yards in diameter, lies about 300 yards northward of Calf Island.

Green Island, a small island of moderate height, with an undulating surface, and faced on its eastern side by whitish-looking rocks, lies about ⅜ mile northeastward of Little Calf Island.

Georges Island, on the southwest side of The Narrows, about ⅝ mile southwestward of Narrows Lighthouse, is entirely covered by **Fort Warren.**

Lovell Island, on the north side of the Main Ship Channel, lies about ¼ mile northward of Georges Island and is about 30 or 40 feet high. The northern and southeastern ends of the island are protected by sea walls which are joined by a stone apron, and on the northern end of the island are the two lighted range beacons for the outer section of the Broad Sound South Channel (see table, page 12). On the south side of the island is the buoy depot wharf of the Light-House Establishment.

Gallup Island, narrow and bare of trees, with a precipitous face on its northern side, is on the western side of the channel, directly opposite Lovell Island, and on it is the **Quarantine Hospital,** under the control of the Board of Health. The cliff and sea face of Gallup Island are protected from the action of the water by a granite sea wall.

Long Island, lying about ½ mile westward of Gallup Island and on the southern side of the channel, is 1¼ miles long in a **NE.** and **SW.** direction, and about 80 feet high at its highest parts. The northern end (and highest part) of this island is called **Long Island Head.** This head shows a steep, waterworn cliff northward, and on its summit is **Long Island Head Lighthouse** (see table, page 14).

Spectacle Island, lying about 1 mile westward of Long Island and on the south side of the channel, is two small islands about 65 feet high, connected by a low gravel pit. Except on the southern side, these islands have

* Shown on charts **109,** scale $\frac{1}{80,000}$; **337,** scale $\frac{1}{40,000}$; **246,** scale $\frac{1}{20,000}$; **248,** scale $\frac{1}{10,000}$; price of each $0.50.

cliff-like faces. There is a group of houses near the southern end of each of the islands, and a factory with iron stack on the north end of the southern island. On the north end of the north island are the lighted range beacons for the inner section of Broad Sound South Channel, and of the Spectacle Island Range.

Thompson Island, about ½ mile westward of Spectacle Island and off the entrance to Neponset River, is about 75 feet high at its highest part, where there is a group of buildings surrounded by ornamental grounds. The island presents a precipitous face northward, but is low facing southward with clumps of trees. There is a wharf on the western side of the island.

Castle Island, covered by **Fort Independence** (granite, surmounted by sod traverses), lies on the south side of the channel about 2½ miles **WNW.** from Long Island Head Lighthouse. It is connected with the mainland by a long bridge.

Governors Island, on the northern side of the channel, a little over ½ mile from Castle Island, is of irregular shape, about ½ mile long, and about 90 feet high at its highest point, where there is a small stone fort. The southeastern part of the island is much lower and has a few small water batteries near the shore. A channel, in which there is a least depth of 17 feet, leads between it and **Apple Island,** which lies about ⅝ mile **ENE.** from it.

From many of the islands above described shoals make out, and are described under the head of "dangers," following the sailing directions.

Boston Harbor proper, or the **Inner Harbor,** begins westward of Castle and Governors islands. Extensive improvements are in progress to increase the depth in the channel and the area available for anchorage for large vessels. In 1902 dredges were at work removing a part of Bird Island Flats to a depth of 30 feet.

The **City of Boston** includes within its limits **East Boston, Charlestown, South Boston, Roxbury, Dorchester,** and **Neponset.** East Boston is on the northeastern side of the harbor, and is separated from the city of Chelsea by Chelsea River. Chelsea is separated from Charlestown, on the western side of the harbor, by the Mystic River, and Charlestown from Boston proper by the Charles River.

The **U. S. Navy Yard** occupies a large part of the deep water front of Charlestown, and is conspicuous on account of its foundries, and other large buildings. South Boston is on the peninsula southeast of the city proper, from which it is separated by South Bay and the narrow channel (Fort Point Channel) leading into it.

Chelsea River is a narrow stream flowing into the northern part of the harbor and separating East Boston from the city of Chelsea. It has a depth of 18 feet in the channel for a distance of 1 mile above its mouth. The draw in the first bridge, crossing the river at Meridian street, has a width of 59 feet, and the second bridge, at Chelsea Street, has a width of 36 feet in the draw.

Mystic River takes its rise at **Medford,** 3½ miles above its mouth, and flows through a narrow and crooked channel, with a general direction about **SE.** into the northern part of Boston Harbor. Near its mouth it is crossed by Chelsea Bridge, connecting Charlestown with Chelsea. A channel not less than 25 feet deep at mean low water, with a least width of 100 feet, leads between the Charlestown district and East Boston to the draw in Chelsea Bridge. Above Chelsea Bridge, for a distance of nearly ½ mile, the channel has been dredged to a width of 125 to 240 feet and a depth of 25 feet. The deepest draft taken to Medford is 9 feet, and to Malden 10 feet. The width of the draw in Chelsea (the first) Bridge is 60 feet and Malden (the second) Bridge is 50 feet.

Charles River empties into the western part of the harbor between Boston proper and Charlestown, and is the approach by water to the city of **Cambridge** and town of **Watertown.** Seven bridges cross the river at points less than 1¼ miles from its mouth. Four of these are railroad bridges, the draws of which are closed except for a short specified time each day. There is a channel with 18 to 23 feet of water in the Charles River for a distance of about 1¼ miles from its mouth, up to Cragie (the seventh) Bridge, but the numerous bridges greatly retard its free navigation. Above Cragie Bridge the channel has a least depth of 7 feet and width of 200 feet to Western Avenue Bridge. There are two hauling buoys placed in mid-channel, about 500 yards below the Charlestown (first) Bridge. Towboats from the harbor take vessels through, if specially engaged for the purpose. The least width in the clear of the draws in the first eight bridges is 36 feet.

At mean low water the depth off the city of Cambridge between Cragie and West Boston bridges is 11 to 19 feet. At high water 9 feet can be carried up to Watertown, which is as far as vessels go. Towboats are employed by sailing vessels going up the river.

Fort Point Channel and **South Bay** separate Boston proper from South Boston. In a distance of 1 mile from its entrance in Boston Harbor, Fort Point Channel is crossed by seven bridges, the least width in the draws of these bridges being 41 feet 5 inches. The upper bridge (Dover Street) has a width of 37 feet in the draw. A dredged channel 175 feet wide and 23 feet deep leads from the entrance through Congress Street Bridge, and it is proposed to continue this channel to near Federal Street Bridge. From the latter bridge to Dover Street Bridge the depth is about 11 feet in the channel, and from thence to the head of South Bay it is 6 to 8 feet.

Sailing vessels employ towboats if bound into Fort Point Channel or South Bay, under a special agreement to tow through the bridges.

Prominent objects.—In approaching and entering Boston Harbor the most conspicuous object is the **State House,** built on the highest part of the city, its large gilded dome being visible for many miles. **Bunker Hill Monument** in Charlestown, the tall chimney of the large brick building on Deer Island, Great Brewster Island, Point Allerton, Nantasket Hill and Strawberry Hill (see descriptions of the last four) should also be easily recognized as the entrance is approached.

At night Boston Light-vessel and the many lights (see table, page 12) of the bay and harbor should make the approach to the entrance easy, but strangers should not attempt to enter at night, as the channels are narrow in many places, and the many lights are apt to be confusing. (To make an anchorage in Nantasket Roads at night, see section 2 A. sailing directions.)

Channels.—There are a number of channels leading into Boston Harbor. The principal ones leading in from deep water are the Main Ship Channel, Broad Sound South Channel, and Broad Sound North Channel.

Main Ship Channel.—The entrance to this channel is between Lighthouse Island (on which is Boston Lighthouse) on the north and Point Allerton on the south, and is 1⅛ miles wide, but shoals and ledges on both sides reduce the navigable width to a little over ½ mile. In The Narrows its width is about 275 yards. The course is first about **W.** for 1⅛ miles, then leads through The Narrows, between Narrows Lighthouse (on Great Brewster Spit) and Georges Island (Fort Warren); then between Lovell Island and Gallup Island until up with Nix Mate beacon; then toward Deer Island, joining the Broad Sound Channels; then through President Roads, passing southward of Deer Island Lighthouse and northward of Long Island Head and Spectacle Island, and then about **NW. ½ N.** up to the city, passing between Governors Island on the north and Castle Island on the south. This channel, 7½ miles in length from the entrance to the anchorage off the Boston wharves, has been improved, and in 1902 had a least width of 450 feet in The Narrows and 500 feet in the Upper Harbor, with a navigable depth of 27 feet throughout its length. Improvements are in progress to deepen the channel in the Upper Harbor to 35 feet with a width of 1,200 feet. This channel is to connect through President Roads with a 35-foot channel 1,500 feet wide through Broad Sound.

Broad Sound South Channel.—This channel has its entrance in Broad Sound northward of The Graves, and leads into President Roads. There are shoals and dangers on both sides, but the channel has been improved, and in 1903 had a least width of 925 feet and a depth of 28 feet, so that at three-quarters flood vessels of the deepest draft should have no trouble in entering by it in clear weather. This channel is marked by two lighted ranges and a number of buoys.

Broad Sound North Channel.—This channel leads from Broad Sound across Great Faun and Little Faun bars into President Roads. Its entrance is just westward of the entrance to Broad Sound South Channel, and its direction is about **WSW.** Although 13 feet at mean low water can be carried across the two bars, the channel with this depth is narrow and it should not be attempted by strangers of over 9 feet draft at low water.

Governors Island Channel.—This channel, which is well buoyed but is only fit for steamers, begins at the eastern end of Governors Island Flats and leads in a **NW.** by **W.** direction, between Governors Island and Apple Island, for a little over 1½ miles. Then, turning abruptly southward, it leads between Bird Island Flats and Governors Island into the Main Ship Channel. It is crooked at its western end and quite narrow; but a steamer can carry 17 feet at mean low water throughout its entire length.

In addition to the channels already mentioned there are several others, sometimes used by those who are well acquainted with their dangers. These are: (1) the **Hypocrite Channel,** which connects Boston Bay with the Broad Sound South Channel; (2) the **Black Rock Channel** connects the Main Ship Channel with the Hypocrite Channel; (3) the **Back or Western Way,** leads southward and westward of the islands that form the southern limits of the Main Ship Channel, leaving that channel at the entrance to Nantasket Roads; the Back or Western Way carries deep water as far as Long Island, but beyond this point only 9 feet can be carried with safety; (4) **Shirley Gut,** a narrow slue with a channel less than 80 yards wide between Deer Island and Point Shirley, carrying about 9 feet of water, connects Broad Sound directly with President Roads; (5) **the dredged channel** between Long Island and Nix Mate has a depth of 14 feet and width of 200 feet.

Anchorages.—**Nantasket Roads** is a good anchorage on the south side of the entrance to the Main Ship Channel, south of Narrows Lighthouse and Georges Island (Fort Warren). The depth here varies from 5 to 11 fathoms; but on the western side of Georges Island the depth ranges from 3½ to 5 fathoms, and better bottom is found and shelter in easterly winds. This anchorage is frequently used by vessels bound through the Main Ship Channel and headed off by the winds, and vessels seeking shelter in easterly gales.

President Roads, a wide and good anchorage, lies between Governors Island Flats and Deer Island Flats on the north, Deer Island on the east, Long Island and Spectacle Island on the south, and Castle and Governors

islands on the west. It is within these limits, 1¾ miles long and nearly ¾ mile wide, and is entered from the Main Ship and Broad Sound channels at its eastern end.

Inner Harbor.—The anchorage for vessels and yachts in the inner harbor is limited, but good holding ground in 3¾ to 4 fathoms will be found on both sides of the channel above Governors Island within the limits prescribed by the harbor master (see Appendix II).

The **buoyage** of Boston Harbor and its tributaries accords with the system adopted in United States waters (see page 5). The channels leading to Boston are well buoyed; but strangers should not attempt them at night, as they have sudden changes in direction, are narrow in places, and are liable to be confusing to strangers.

The **table of lighthouses**, on page 12, gives the characteristics of the lights in Boston Harbor.

Bearings and distances from certain lighthouses are given on pages 22–24.

Pilots.—There are a number of pilots for the port of Boston who cruise by turns in pilot boats which are designated by the numbers painted in black figures 4 feet in length on the mainsail and jib. Three of the pilot boats are required to cruise in Boston Bay outside of the inner station boat.

Pilotage.—The rates of pilotage for Boston, and extracts from the laws and regulations relating to pilots and pilotage, are given in Appendix II.

Towboats are constantly cruising in Boston Bay and Harbor, and may be obtained by hailing or by signal. They may also be obtained by applying at the various towboat offices. The greater number of these towboats have an established schedule of charges. Towboats do not assume accountability for damage while towing through bridges. Pilotage charges, if incurred, are paid by the vessel being towed.

Fire and wrecking tugs are to be obtained, and will take tows to or from any point on the Atlantic coast between Nova Scotia and the Gulf of Mexico. Steam lighters can be obtained.

Harbor regulations are given in Appendix II.

Quarantine regulations for the port of Boston are issued from time to time by the board of health for the guidance of the port physician, harbor master, pilots, and all vessels (see Appendix II). The quarantine station is on Gallup Island, where vessels are boarded by the visiting health officer. Vessels undergoing quarantine are anchored either at the anchorage south of Gallup Island or in President Roads, as directed by the port physician.

Marine Hospital.—There is a marine hospital of the United States Public Health and Marine-Hospital Service at Chelsea. The service has an office and dispensary in the customhouse, Boston, where out-patients are treated by an officer of the service, who is also the proper person to whom to apply for admission to the hospital. Extracts from the regulations for the government of the United States Public Health and Marine-Hospital Service are given in Appendix IV.

Docking facilities.—There are a number of Simpson dry docks and marine railways. The dimensions of the largest dock, not owned by the Government, are: length 465 feet, width 66 feet, depth over sill 18 feet 8 inches; of the largest marine railway: length 250 feet, draft forward 12 feet, draft aft 15 feet, capacity 2,000 tons.

Repairs.—There are excellent facilities for repairing hulls of iron and wooden vessels and the machinery of steamers at Boston and Quincy Point.

Storm warning displays of the United States Weather Bureau are shown from the post office building, and on Nantasket Hill at the entrance to the harbor. An explanation of the use and meaning of these signals is given in Appendix III.

A **United States Branch Hydrographic Office** is established at the customhouse, Boston. Bulletins are posted here giving information of value to seamen, who are also enabled to avail themselves of publications pertaining to navigation, to take barometer comparisons, and to correct their charts from standards. No charge is made for this service.

A **time ball** is dropped daily, Sunday excepted, on a staff on the Ames Building, corner of State and Washington streets, at 12 h. 00 m. 00 s. of 75th meridian time, 5 h. 00 m. 00 s. Greenwich mean time. This time signal can be seen by shipping anchored in the harbor.

Ice.—The Main Ship Channel into Boston Harbor is kept open by the constant employment of towboats, which break the ice in towing vessels up and down. In the minor passages, navigation is sometimes suspended during severe weather. Communication with Boston being, as a rule, carried on through the Main Ship Channel, the ice boats do not enter the other channels to break the ice. The Charles, Mystic, and Chelsea rivers are, as a rule, closed to navigation during a part of the winter. During very severe weather the ice sometimes forms as far out as the edges of the Main Ship Channel.

From the middle of January to the middle of February sailing vessels should not attempt to pass in or out of the harbor without the assistance of a towboat, as navigation is rendered hazardous on account of quantities

of drift ice in the channel. Vessels entering the harbor during the winter should not depend too much upon the buoys, as these are apt to be forced from their proper positions and even carried away by the drift ice. As accidents of this sort are liable to occur every winter, no stranger should attempt to enter the harbor during these months without a pilot.

Tidal data for Boston Harbor is given on page 11.

CURRENT TABLE FOR MAIN SHIP CHANNEL FROM BOSTON LIGHTHOUSE TO THE NAVY YARD.

The direction of the current is given in the upper line, and the velocity, in miles and tenths, in the lower line. The bearings and directions are true (not magnetic), and distances are in nautical miles.

HIGH WATER.							LOW WATER.						
Hours before.			Hours after.				Hours before.			Hours after.			
3	2	1	0	1	2	3	3	2	1	0	1	2	3
Current Stations in Boston Harbor, referred to time of tide at Boston (Navy Yard).													
(1) Five-tenths Mile S. 8° E. from Boston Lighthouse.													
S 78° W	S 78° W	S 76° W	S 76° W	N 88° E	N 82° E	N 80° E	N 80° E	N 82° E	N 89° E	SE	S 75° W	S 77° W	S 78° W
1.8	1.7	1.2	0.1	0.6	1.4	2.0	2.0	1.8	0.9	0.1	0.9	1.6	1.8
(2) Three-tenths Mile S. 50° E. from Narrows Lighthouse.													
S 68° W	S 74° W	S 83° W	S 84° W	N 65° E	N 57° E	N 54° E	N 53° E	N 51° E	N 51° E	N 69° E	S 79° W	S 70° W	S 68° W
1.6	1.4	0.9	0.3	0.6	1.2	1.4	1.4	1.1	0.7	0.1	0.8	1.2	1.6
(3) Four-tenths Mile N. 80° W. from Narrows Lighthouse.													
S 88° W	S 85° W	S 72° W	N 75° E	N 85° E	N 89° E	E	S 88° E	S 85° E	S 86° E	S 85° E	N 85° W	N 88° W	S 89° W
1.6	1.2	0.5	0.4	0.9	1.3	1.5	1.5	1.5	1.1	0.3	0.9	1.6	1.6
(4) Eight-tenths Mile N. 68° W. from Narrows Lighthouse.													
N 43° W	N 42° W	N 42° W	N 42° W	N 41° W	N 37° W	N 30° W	N 28° W	N 20° W	N 11° W	S 44° E	S 44° E	S 48° E	N 43° W
0.5	0.6	0.4	0.2	0.3	0.6	0.8	0.8	0.6	0.1	0.2	0.4	0.2	0.4
(5) At the Bell Buoy off Nix Mate.													
S 10° W	----------	N 42° E	N 82° E	N 82° E	N 20° E	N 17° W	N 17° W	----------	S 30° W	S 75° W	S 63° W	S 21° W	S 11° W
0.2	0.0	0.3	0.5	0.5	0.4	0.2	0.2	0.0	0.2	0.3	0.4	0.4	0.3
(6) Broad Sound South Channel, 1.2 Miles N. 85° E. from Deer Island Lighthouse.													
S 75° W	S 76° W	S 76° W	S 77° W	N 59° E	N 61° E	N 63° E	N 63° E	N 64° E	N 64° E	N 65° E	S 70° W	S 75° W	S 75° W
1.5	1.3	0.9	0.1	0.8	1.5	1.8	1.8	1.8	1.4	0.1	0.9	1.4	1.5
(7) Two-tenths Mile S. from Deer Island Lighthouse.													
S 86° W	S 83° W	S 87° W	N 84° W	N 86° E	N 87° E	N 86° E	N 86° E	N 81° E	N 74° E	N 58° E	N 78° W	N 85° W	S 87° W
2.1	2.3	1.5	0.1	1.1	2.0	2.9	2.8	3.0	2.1	0.3	0.8	1.4	2.0
(8) Three-tenths Mile N. 10° W. from Spectacle Island Range Beacon (Front).													
N 80° W	N 81° W	N 87° W	S 88° W	N 68° E	N 71° E	N 74° E	N 75° E	N 81° E	N 87° E	S 85° W	N 89° W	N 83° W	N 80° W
1.0	0.8	0.5	0.2	0.1	0.7	0.9	0.9	0.7	0.1	0.2	0.5	0.8	1.0

CURRENT TABLE FOR MAIN SHIP CHANNEL FROM BOSTON LIGHTHOUSE TO THE NAVY YARD—Continued.

HIGH WATER.							LOW WATER.						
Hours before.			Hours after.				Hours before.			Hours after.			
3	2	1	0	1	2	3	3	2	1	0	1	2	3
Current Stations in Boston Harbor, referred to time of tide at Boston (Navy Yard)—Continued.													
(9) Three-tenths Mile N. from Castle Island Wharf.													
N 39° W	N 40° W	N 41° W	.....	S 47° E	S 44° E	S 42° E	S 42° E	S 42° E	S 43° E	.....	N 35° W	N 37° W	N 30° W
1.5	1.4	0.9	0.0	0.7	1.1	1.3	1.4	1.3	0.8	0.0	0.9	1.3	1.5
(10) Four-tenths Mile S. of Bird Island Flats Spindle.													
N 63° W	N 60° W	N 58° W	N 56° W	S 57° E	S 57° E	S 59° E	S 60° E	S 66° E	S 75° E	S 85° E	N 75° W	N 68° W	N 63° W
1.2	1.0	0.5	0.1	0.1	0.6	0.9	1.0	1.1	0.9	0.2	0.6	1.1	1.2
(11) Three-tenths Mile S. 25° W. from Cunard Wharf at East Boston.													
N 15° W	N 28° W	N 41° W	N 50° W	S 65° E	S 59° E	S 53° E	S 51° E	S 47° E	S 40° E	S 35° E	N 20° W	N 11° W	N 12° W
1.0	1.0	0.7	0.1	0.4	0.7	0.9	1.0	1.0	0.8	0.2	0.5	0.8	1.0
(12) Mid-channel off Navy Yard, 0.5 Mile N. 65° E. from Draw of Charles River Bridge.													
N 26° W	N 30° W	N 32° W	N 26° W	S 40° E	S 44° E	S 49° E	S 50° E	S 56° E	S 65° E	S 72° E	N 21° W	N 22° W	N 25° W
0.6	0.6	0.5	0.2	0.3	0.5	0.6	0.6	0.5	0.4	0.1	0.2	0.5	0.6

Between Boston Lighthouse and Point Allerton the ebb current begins about 10 minutes after high water, and the flood current about 10 minutes after low water, at the Navy Yard. The flood sets up channel, but the ebb coming from Nantasket Gut sets somewhat across the channel toward the Spit. Care must be taken accordingly.

Vessels bound up through The Narrows must be careful, after passing False Spit beacon, not to be set on to Georges Island rocks on the flood tide, as the current of the flood sets through the Black Rock Channel on to Georges Island. The ebb sets through the same channel, and *vessels coming down from The Narrows*, between Lovell and Gallup islands, are in danger of being carried by it on to Whiting Ledge or into the Black Rock Channel.

The flood, setting *between Gallup and Georges islands*, may, in light winds, carry a vessel through when going up; but here the channelway and anchorage are good.

In the northern part of The Narrows the flood during part of its period sets southward, but is not strong. The ebb, which is stronger, sets northward, and it requires a quick-working vessel to beat down The Narrows against an ebb current.

Near Nix Mate the ebb will, in light winds, carry vessels out through the Broad Sound Channel.

Between Long Island Head and Deer Island Lighthouse the ebb begins about 20 minutes after high water, and the flood about 20 minutes after low water, at the Navy Yard.

Along the northwestern side of Long Island the flood sets southwestward for about two hours; the current then turns and sets northward and eastward during the remaining period of flood, and so continues throughout the period of ebb. While setting thus during this period of flood it meets the current coming in through the Broad Sound Channel, and this causes a rip at times near Long Island Head.

The **variation of the compass** for various points between Cape Ann and Point Judith is given on page 11.

GENERAL REMARKS ON APPROACHING BOSTON HARBOR.

General remarks on approaching and standing along the coast are given on pages 26–28.

Approaching the entrance from the vicinity of Cape Ann.—The soundings in the vicinity of Cape Ann are very irregular and can not be depended on to locate even approximately the vessel's position. The southern end of *Jeffrey Ledge*, with depths of 19 to 30 fathoms, extends 15 miles eastward from Cape Ann, and depths of over 50 fathoms are found a few miles eastward and a short distance southward from the edge of the bank. A SW. by W. ½ W. line drawn from the spindle on The Londoner just clears the offshore dangers between Cape Ann and Nahant.

At night, if the weather is clear Cape Ann Lighthouses will be seen nearly 20 miles and will be visible until nearly up to Boston Light-vessel; as the entrance to the harbor is approached a number of lights will be visible, and they are sufficiently numerous to locate the position readily by cross bearings.

Approaching the entrance from the vicinity of Cape Cod.—Approaching the eastern side of the cape, soundings of 20 fathoms indicate a distance of 2 to 3½ miles from the shore, but off the north side of the cape the 20-fathom curve draws closer inshore and the soundings are not so regular. Vessels standing for Boston Light-vessel will cross the southwestern end of *Stellwagen Bank* in depths of 12 to 15 fathoms; this bank, with depths of less than 20 fathoms on it, begins 5 miles north of the north end of Cape Cod and extends in a general N. direction for 17½ miles, its width varying from 8 miles at its southern end to about 2 miles near its northern end. Soundings on Stellwagen Bank can not be depended on to locate a position on the bank except in the case of soundings in a depth of 9½ fathoms, the shoalest water, which is found near its extreme southwestern end and about 6½ miles N. by W. ½ W. from Race Point Lighthouse. The prevailing depths over the shoaler parts of the bank are 12 to 15 fathoms.

As the entrance to Boston Harbor is approached, after crossing Stellwagen Bank, soundings of 20 fathoms or more (at low water) insure a distance of 5 miles or more from the shore and well outside of outlying rocks. Inside the depth of 20 fathoms the soundings are very irregular and they can not, as a rule, be depended on to keep a vessel out of danger; but the use of the lead, on this account, should not be neglected.

At night, in clear weather, Minots Ledge Light will be sighted as soon or shortly after the Lights on Cape Cod (Cape Cod and Race Point lights) are dropped. Boston Light-vessel should be steered for to avoid the rocks and shoal spots lying eastward and northward of Minots Ledge, and on which the sea breaks in heavy gales.

Tidal currents.—For some distance northwestward of Cape Cod the tidal currents have a slight set southward into Cape Cod Bay on the flood and eastward out of the bay on the ebb. Along the north shore of Massachusetts Bay the flood sets in a general westerly or northwesterly direction, and the ebb in a southerly or southeasterly direction. The velocity of the currents is influenced greatly by the force and direction of the wind. Off the entrance to Boston Harbor the flood sets westward and ebb eastward, increasing slightly in velocity as the entrance is approached.

Fogs.—In thick weather Boston Light-vessel should be steered for when approaching from either Cape Ann or Cape Cod, and the water should not be shoaled to less than 20 fathoms unless the fog signal of the light-vessel is heard and the vessel located. From the light-vessel a course may be laid for Boston Lighthouse, and the fog signal of the latter with a frequent use of the lead will enable a vessel to reach an anchorage inside of Point Allerton. Unless the light-vessel is located no attempt should be made to enter the harbor, and the water should not be shoaled to less than 20 fathoms.

Vessels when in the vicinity of Cape Cod, if overtaken by fog or thick easterly weather, may find it convenient to anchor in Providence Harbor, or on the west side of the cape south of Providence, where there is a good lee and holding ground in 7 to 11 fathoms water.

SAILING DIRECTIONS, BOSTON HARBOR.

In following the sailing directions sufficient allowance should be made for tidal currents, the set and drift of which are given on pages 53–54, and it is advisable and generally easy to pick up a range ahead when entering.

The directions for Boston Harbor are arranged in sections, as follows:

1. Approaching Main Ship Channel Entrance, from Northward or Northeastward.

1 A. Approaching Main Ship Channel Entrance, from Eastward or Southward.

2. From Boston Lighthouse through the Main Ship Channel to President Roads.

3. From President Roads to the city of Boston by the Main Ship Channel.

1 B. Approaching and Entering through Broad Sound South Channel to President Roads.

1 C. Approaching and Entering through Broad Sound North Channel to President Roads.

2 A. From the Main Ship Channel Entrance to an Anchorage in Nantasket Roads.

3 A. From an Anchorage in Nantasket Roads or Westward of Georges Island to President Roads.

3 B. From President Roads through Governors Island Channel to the city of Boston.

1. ***Approaching Main Ship Channel Entrance, from Northward or Northeastward.***—Vessels from Cape Ann should follow the directions in paragraph II, under section 1, page 29.

As the entrance is approached keep eastward of a line joining Egg Rock and Minots Ledge lighthouses, bearing *N.* by *W.* ¾ *W.* and *S.* by *E.* ¾ *E.*, until Point Allerton (see description, page 49) bears **SW.** ¾ **W.**, when steer for it until Narrows Lighthouse is just open south of Boston Lighthouse, bearing *W.* Then steer **WSW.** ¾ **W.** so as to pass nearly ½ mile south of Boston Lighthouse and follow the directions in section 2.

If bound to an anchorage in Nantasket Roads, follow the directions in section 2 A.

At night.—Keep eastward of a line joining Egg Rock and Minots Ledge lights until Narrows Light is just open south of Boston Light, bearing **W.**; then steer this course, keeping the range ahead. When Minots Ledge Light bears *SSE.* ¾ *E.*, steer **W.** by **S.**, so as to pass nearly ½ mile south of Boston Light. When Boston Light bears *N.*, distant nearly ½ mile, Narrows Light should bear *WNW.* ¼ *W.*

From Boston Light-vessel.—Steer **W.** ½ **N.** for Boston Lighthouse, and, having stood on this course about 3¾ miles and Minots Ledge Lighthouse bears *SSE.* ¾ *E.*, steer **W.** ½ **S.** so as to pass nearly ½ mile south of Boston Lighthouse. When Boston Light bears *N.*, distant nearly ½ mile, Narrows Light should bear *WNW.* ¼ *W.*

Remarks.—In approaching the entrance, Point Allerton and Great Brewster (see description, page 49), and Boston Lighthouse and Boston Light-vessel (see table, page 12), should be easily recognized. Coming from northeastward a lookout should be kept for the three red nun buoys marking the outlying ledges northeastward of Boston Lighthouse.

The **SW.** ¾ **W.** course for Point Allerton leads ⅝ mile or more southeastward of the nun buoys marking Three and one-half Fathom Ledge, Martin Ledge, and Boston Ledge, and 1 mile southeastward of Outer Brewster.

The **W.** and **W.** ½ **N.** courses for Boston Lighthouse lead ⅝ and ⅜ mile, respectively, north of Thieves Ledge whistling buoy.

Dangers.—**The Graves** are a dangerous group of bare rocks and ledges, extending about ½ mile in a general **NE.** ¼ **N.** and **SW.** ½ **S.** direction. The middle of this ledge lies about 2½ miles **NE.** by **N.** from Boston Lighthouse and 4¼ miles **S.** ¼ **E.** from Egg Rock Lighthouse. Near the northeast end of the ledge and about 450 yards **NE.** from the northernmost bare rock, is a small rock, bare at low water, called the **Northeast Grave**; and ⅝ mile northeastward of the latter is the mammoth whistling buoy, which is the principal thick-weather aid for vessels approaching the Broad Sound Channels from northward.

Three and one-half fathom Ledge is a small, detached spot with a depth of 3½ fathoms. It lies about 2½ miles **NE.** by **E.** ¾ **E.** from Boston Lighthouse and about 1½ miles **S.** by **E.** ½ **E.** from the whistling buoy off The Graves, and is marked by a buoy (nun, red, No. 2) placed southeastward of its shoalest part.

Martin Ledge is a small, detached spot with 17 feet over it, lying 1¾ miles **NE.** by **E.** ¾ **E.** from Boston Lighthouse, and about ¾ mile **E.** from the eastern end of Outer Brewster Island. It is marked by a buoy (nun, red, No. 4) placed eastward of the ledge.

Boston Ledge has 18 feet over it and lies a little over 1⅛ miles **E.** ⅞ **N.** from Boston Lighthouse; it is marked by a buoy (nun, red, No. 6). There are spots with 14 and 15 feet over them westward of the ledge.

Thieves Ledge has depths of 4½ to 6 fathoms over it and is about ¾ mile long **ESE.** and **WNW.** and about ¼ mile wide; the middle of the ledge lies about 2½ miles **ESE.** ½ **E.** from Boston Lighthouse. It is dangerous in heavy easterly gales, when the sea breaks on it. At low water it should be avoided by vessels of over 24 feet draft even in a smooth sea. The ledge is marked north of its shoalest part by a whistling buoy. There is a spot with 5¾ fathoms over it lying nearly 1¼ miles **SE.** ¾ **E.** from the whistling buoy, and another 5¾-fathom spot a little over ¼ mile **E.** ½ **S.** from this buoy upon which the sea sometimes breaks in heavy easterly gales.

Harding Ledge and the dangers between it and Minots Ledge are described under section 1 A, following.

Shag Rocks or **Egg Rocks** are a cluster of bare, dark rocks lying eastward of Boston Lighthouse, and should not be approached from southward closer than ¼ mile.

A 14-foot spot lies about 400 yards **S.** by **E.** from the lighthouse.

Point Allerton Bar makes off a little more than ⅝ mile eastward and northward from Point Allerton. At its northern side is a buoy (can, black, No. 3) and near the end of the dry part of the bar is a beacon (pyramidal stone structure, with shaft and black cone on top). **Ultonia Ledge** with a least depth of 3½ fathoms lies over 1 mile **E.** by **N.** from the beacon.

A spot with 3¾ fathoms over it lies nearly ⅝ mile **S.** ⅞ **W.** from Boston Lighthouse.

1 A. ***Approaching Main Ship Channel Entrance, from Eastward or Southward.***—*I. Deep-draft vessels.*—With the standpipe in Provincetown bearing *SW.* by *W.*, distant 4½ miles, and the whistling buoy off Peaked Hill Bar 1 mile distant and nearly in range with the standpipe, steer **NW.** ½ **W.** for 31 miles to Boston Light-vessel.

Or, bring Race Point Lighthouse to bear *SE.* ⅜ *S.* over the stern and steer **NW.** ⅜ **N.** for Boston Light-vessel.

From Boston Light-vessel steer **W.** ½ **N.** for Boston Lighthouse, and having stood on this course about 3¾ miles and Minots Ledge Lighthouse bears *SSE.* ¾ *E.*, steer **W.** ½ **S.** so as to pass nearly ½ mile south of Boston Lighthouse. When Boston Lighthouse bears *N.*, distant nearly ½ mile, Narrows Lighthouse should bear *WNW.* ¼ *W.*; then follow the directions in section 2.

If bound to an anchorage in Nantasket Roads follow the directions in section 2 A.

Remarks.—On the above courses for Boston Light-vessel a high, dark-gray tower with pointed top, on the high land about 1¼ miles inland and 4 miles **S.** by **W.** ½ **W.** from Minots Ledge Lighthouse, will be the first object sighted, and should be well on the port bow. The courses lead about 3½ miles northeastward of Minots Ledge Lighthouse and clear the shoal spots eastward of it. A white nun marking buoy is placed about ¼ mile northeastward of the light-vessel.

On the **W.** ½ **N.** course when heading for Boston Lighthouse, Narrows Lighthouse will be open southward of Boston Lighthouse, and having stood on the course 3¾ miles the whistling buoy on Thieves Ledge should be a little over ½ mile distant and about in range with Minots Ledge Lighthouse, bearing **SSE.** ¾ **E.**

The **W.** ½ **S.** course leads fair for the entrance and leaves the black can buoy, on Point Allerton Bar, about 500 yards on the port hand.

See the dangers under paragraph II, following.

II. Vessels of 18 feet or less draft with a smooth sea.—When Boston Lighthouse is made, it may be steered for on any bearing between **W.** and **NW.** by **W.** ¼ **W.** until about 1¼ miles from it, when the course should be changed so as to pass nearly ½ mile southward of it. Then follow the directions in section 2.

In coming from southeastward or southward, when Minots Ledge Lighthouse is made, steer so as to pass ¾ mile northeastward of it on any course westward of **NNW.** ½ **W.** When this lighthouse bears *SW.*, distant ¾ mile, steer **NW.** ¾ **W.**; Boston Lighthouse, if not then visible, should be made right ahead, and should be kept on the bearing until within about 1 mile of it and Narrows Lighthouse bears **WNW.** ½ **W.**, when the course should be changed to head for Narrows Lighthouse and so as to pass nearly ½ mile southward of Boston Lighthouse. Then follow the directions in section 2, following.

If bound to an anchorage in Nantasket Roads, follow the directions in section 2 A.

Remarks.—For prominent objects in approaching see page 51. On a clear day Boston Lighthouse should be made when abreast of Minots Ledge Lighthouse, if not before.

The **NW.** ¾ **W.** course (on a bearing for Boston Lighthouse) leads between Harding Ledge and Thieves Ledge, and to clear both of these ledges the bell buoy off Harding Ledge should be left about 400 yards on the port hand. Point Allerton beacon and Narrows Lighthouse will show on the port bow, and when approaching the entrance and hauling westward the latter should be ahead, bearing about **WNW.** ½ **W.**

Dangers.—**Stellwagen Ledges** is the name applied to the large number of rocks and sunken ledges which fringe the coast from Minots Ledge to Scituate Harbor. Some of these sunken ledges lie over 1 mile from shore, and have from 7 to 14 feet over them in surrounding depths of 4 to 9 fathoms. When in this vicinity strangers should keep over 1¼ miles from the shore while the old light-tower at Scituate bears southward of **SW.** A buoy (can, black, No. 1) is placed a little over ⅝ mile **E.** by **S.** from Minots Ledge Lighthouse, eastward of the ledges near it.

A small, rocky patch with 8½ fathoms over and 9 to 18 fathoms around it, lies 2⅝ miles **E.** ½ **S.** from Minots Ledge Lighthouse.

Jason Shoal is a small, detached shoal with 5¼ fathoms over it, lying 1¼ miles **NE.** by **E.** ½ **E.** from Minots Ledge Lighthouse. The sea breaks on this ledge during heavy gales and also over a small 4½-fathom spot (**Sylveter Rocks**) lying ½ mile **NE.** from the lighthouse.

Davis Ledge, with a least depth of 13 feet, lies over ⅝ mile **ESE.** ¾ **E.** from Minots Ledge Lighthouse; it is marked by a buoy (can, black, No. 1). Vessels should pass well eastward of this buoy.

Harding Ledge shows bare at half tide and is marked by a spindle; it is a little southward of a line from Minots Ledge Lighthouse to Boston Lighthouse and lies 1⅝ miles **SE.** by **E.** ½ **E.** from Point Allerton beacon. A black bell buoy and a gas-lighted buoy are placed about ⅝ mile **NE.** from the spindle on the ledge.

Westward of Harding Ledge are **a number of spots** with 15 to 18 feet over them, and a small rock, showing bare at low water, lies about ¼ mile **SW.** from the spindle.

Ultonia Ledge, with 3½ to 5 fathoms over it, is the eastern end of the rocky, broken ground which extends 1⅝ mile **E.** by **N.** from Point Allerton. It is a danger to deep-draft vessels.

See also dangers under section 1, foregoing.

2. ***From Boston Lighthouse through the Main Ship Channel to President Roads.***—From a position nearly ½ mile south of Boston Lighthouse steer **W.** by **N.**, pass about 225 yards south of Nash Rock buoy (spar, red, No. 8), and about 80 yards south of Kellys Rock buoy (spar, red, No. 8½); then haul a little northward so as to pass 200 yards southward of Narrows Lighthouse.

With Narrows Lighthouse bearing *N.* distant about 200 yards steer **NW.** ½ **W.** for Nix Mate beacon until the southern end of Lovell Island bears *E.* Then steer **NW.** ¾ **N.** and leave red nun buoy, No. 10, about 200 yards on the starboard hand and Nix Mate bell buoy about 50 yards on the port hand. When past the bell buoy, haul westward, course **W.** by **N.**, so that Long Island Head Lighthouse will be ¼ mile distant when it bears *S.*, then follow the directions in section 3, following.

Desiring to anchor in President Roads.—When 100 yards northward of Nix Mate bell buoy steer about **WNW.** and anchor before Deer Island Lighthouse bears *E.* by *S.* distant ¼ to 1¼ miles.

Remarks.—The sailing line carries a least depth of 27 feet of water.

The **W.** by **N.** course heads nearly for the middle of Georges Island. After passing Nash Rock buoy, Kellys Rock buoy will be made a little on the starboard bow and a black gas-lighted buoy should be nearly ahead. When past Kellys Rock buoy the course is changed so as to lead about midway between this gas-lighted buoy and Narrows Lighthouse. Two stone beacons will be seen, one **N.** of Kellys Rock buoy, and the other a short distance southeastward of Narrows Lighthouse.

On the **NW.** ½ **W.** course for Nix Mate beacon, the southern end of Lovell Island is given a berth of about 200 yards, and during the strength of the current care must be taken not to be set off the course (see page 54).

On the **NW.** ¾ **N.** course the bell buoy off Nix Mate beacon will be a little on the port bow and Deer Island Lighthouse will show a little westward of it. The highest point of Deer Island with the flagstaff will be a little on the starboard bow, and the course leads about 150 yards from the westernmost end of Lovell Island. The red nun buoy on Seventy-four Bar will be left about 200 yards on the starboard hand.

Dangers.—**Nash Rock Shoal** has 20 feet over it and lies ⅝ mile **SW.** from Boston Lighthouse; it is marked near its shoalest part by a buoy (spar, red, No. 8).

A spot with 3¾ fathoms over it lies nearly ⅝ mile **S.** ⅞ **W.** from Boston Lighthouse.

Hunt Ledge, a detached spot with a least depth of 10 feet over it, lies nearly ¾ mile **SE. ¾ S.** from Narrows Lighthouse; it is marked by a buoy (nun, red and black horizontal stripes). This buoy should not be approached from northward closer than 300 yards. There is a depth of 21 feet between this buoy and the black buoy southward of it.

Great Brewster Spit and Kelp Ledges extend from Narrows Lighthouse to Boston Lighthouse on the north side of the channel. At low water the whole of the bar shows bare; near its western end is **Narrows Lighthouse**, eastward of which are two stone beacons placed on the dry part of the spit. The easternmost is known as **False Spit beacon** and the one near the lighthouse as **Spit beacon.**

Kellys Rock, with 3¾ fathoms over it, lies 325 yards **S.** by **E. ½ E.** from False Spit beacon; it is marked on its southern side by a buoy (spar, red, No. 8½).

A small 3¾ fathom spot lies about 300 yards **SSE.** from the buoy on Kellys Rock.

Georges Island Rocks make off for a distance of 600 yards eastward from Georges Island; they are marked by a buoy (black, gas-lighted) at their northeastern end. A large part of the shoal on the east side of Georges Island is dry at low water.

A shoal extends along the west side of The Narrows from the east end of Gallup Island to the gas-lighted buoy off Nix Mate.

Nix Mate is a large, rocky shoal, partly bare at low water, lying northward of Gallup Island. Near the middle of its dry part is a large beacon with a square granite base and wooden octagonal pyramid on top. The northeastern end of this shoal is marked by a black gas-lighted buoy, and about 30 yards northeastward from this buoy is a black bell buoy; on the northernmost end of the shoal is a black spar buoy.

Seventy-four Bar makes westward from the northern end of Lovell Island; it is partly bare at low water and is marked off its western side by a buoy (nun, red, No. 10).

3. ***From President Roads to the City of Boston by the Main Ship Channel.***—With Long Island Head Lighthouse bearing *S.*, distant ¼ mile, steer **W. ¾ N.** and pass ¼ mile north of Spectacle Island. Then bring the two range beacons on the northeast end of Spectacle Island in line, bearing *SE. ½ S.*, and steer **NW. ½ N.** until the northern edge of Governors Island is in range with the northern edge of Apple Island, bearing about *E. ¾ N.* Then steer **NW.** up to the city, and anchor within the limits (see Appendix II) prescribed by the harbor master.

Bound up the Charles River.—Continue the **NW.** course until nearly on a line between the elevators in South Boston and East Boston, and then haul northward heading for the tall chimney in the Navy Yard (course about **N.** by **W. ½ W.**). When nearly up to the Navy Yard, follow the turn in the port-hand shore and anchor below the bridge as close as practicable to the wharves on the south side (see page 50).

Bound to Chelsea or up the Mystic River.—Continue the **NW.** course and when nearly on a line between the elevators in South Boston and East Boston haul northward; follow the wharves on the starboard hand, giving them a berth of about 150 yards. A stranger should take a towboat to pass through the bridges of Chelsea or Mystic rivers.

Remarks.—The sailing line if closely followed carries a least depth of 27 feet of water to the city of Boston.

The **W. ¾ N.** course leads ¼ mile **N.** of Spectacle Island, and nearly on the South Boston Range (this range is difficult for a stranger to pick up either in the daytime or at night). **Fort Independence**, a granite structure on Castle Island, will be on the starboard bow and the gilded dome of the State House will be seen northward of it. The range beacons on the northeast end of Spectacle Island will be seen and be left ¼ mile on the port hand.

On the **NW. ½ N.** course the black can buoy and black bell buoy, lying close together and southeastward of Fort Independence, will be left about 325 yards on the port hand. Three red spar buoys on the western edge of the Lower Middle and Governors Island Flats will be left about 150 yards on the starboard hand. After passing red spar buoy No. 12, a black gas-lighted buoy and its marker, and black spar buoy No. C1 will be left 150 yards on the port hand, and when about ¼ mile above the latter the northern edges of Governors and Apple islands will be in range. (Note: While the channel is being improved these buoys may not always be in the positions indicated).

The **NW.** and **N.** by **W. ½ W.** courses lead in mid-channel. In 1903 dredges are at work on the southwestern side of Bird Island Flats, which are to be partly dredged to a depth of 30 feet. When abreast the elevators in South Boston, Fort Point Channel, leading into South Bay, will be opened southwestward. It is advisable for

vessels going alongside the wharves to take a towboat. No vessel propelled by steam is permitted to pass within 100 yards of the wharves at a greater speed than 5 miles.

Dangers.—**Shoals** extend 225 yards northward from Long and Spectacle islands.

Lower Middle is a shoal partly bare at extreme low water, nearly 1 mile long in a **SE.** by **E.** ½ **E.** and **NW.** by **W.** ½ **W.** direction, lying eastward of Fort Independence and on the northern side of the Main Ship Channel. Its eastern extremity is marked by a buoy (nun, red, No. 6) and its channel side is marked by two buoys (spars, red, Nos. 8 and 10).

Governors Island Flats are described under section 3 B.

Castle Rocks extend eastward from Castle Island and show partly bare at low water; near their eastern end they are marked by two buoys (a black can and a black bell). The northeastern end of Castle Island, near the wharf, is comparatively bold-to.

A shoal extends nearly ¼ mile southward from the southern end of Governors Island, and is marked at its southern end by a buoy (spar, red, No. 12). From this buoy the edge of the shoal, extending southwestward from Governors Island, runs about ⅝ mile **NW.** ½ **N.** along the channel. The black spar buoy at the western extremity of the shoal marks the channel between it and Bird Island Flats, and should be left well on the starboard hand by vessels in the Main Ship Channel.

South Boston or **Dorchester Flats** make out northward and eastward from South Boston; the channel edge of these flats extends from the northern end of Castle Island nearly ⅞ mile in a **NW.** ¾ **N.** direction, and thence to the wharves east of Fort Point Channel. **Upper Middle,** nearly ½ mile **NNW.** from Fort Independence, has been partly removed and is marked at its eastern edge by a buoy (black, gas-lighted).

Slats Ledge, with about 4 feet over it, is on the northern edge of South Boston Flats and just eastward of the line of the wharves south of the entrance to Fort Point Channel. Its northern edge is marked by black spar buoy No. 11.

Bird Island Flats, a large area of which is dry at low water, lie between the wharves of East Boston and Governors Island, and extend to the edge of the channel. Near their southeastern end, where there is a channel to pass north of Governors Island, is a buoy (spar, red, No. 12) and 150 yards **N.** of the buoy a spindle (iron, red, with cage on top). The southwestern part of these flats are being dredged to a depth of 30 feet.

1 B. ***Approaching and Entering, through Broad Sound South Channel to President Roads.***—While Egg Rock Lighthouse bears westward of *N.* by *W.* ¾ *W.* bring Long Island Head Lighthouse to bear **SW.** by **W.** ¾ **W.** and steer for it on this bearing; the whistling buoy northeastward of The Graves should be left ½ mile on the port hand. Continue the course until the eastern end of Outer Brewster Island (the easternmost large island) bears *SSE.* ¾ *E.* The two white conical range beacons on the north end of Lovell Island should then be in line; steer on the range, keeping it close, course **SW.** ¼ **W.**, leaving red nun buoy No. 2 on the starboard hand and the three black can buoys Nos. 1, 3, and 5 about 150 yards on the port hand. When the latter buoy is a little abaft the beam steer **W.** ¾ **S.**, keeping the two red conical towers of the Spectacle Island Range in line ahead; pass 200 yards northward of Ram Head buoy (black, gas-lighted) and black spar buoy No. 9, leaving red nun buoys Nos. 4 and 6 on the starboard hand. Continue the **W.** ¾ **S.** course on the range and pass ¼ mile north of Long Island Head Lighthouse. When the lighthouse bears *S.* steer **W.** ¾ **N.**, and follow the directions under section 3, page 59.

To anchor in President Roads.—When Deer Island Lighthouse bears *N.*, steer **WNW.** and anchor anywhere from ½ to 1¼ miles westward of the lighthouse before it bears *E.* by *S.*

Remarks.—The sailing line if closely followed carries a least depth of 28 feet of water.

On the **SW.** by **W.** ¾ **W.** course standing for Long Island Head Lighthouse, Deer Island Lighthouse will be a little on the starboard bow. Narrows Lighthouse (see table, page 12) will be made on the port bow; Lovell Island (see page 49) is just northward of this lighthouse, and the range beacons on the northern end of the island should be watched, and as soon as they are in line should be steered for.

When standing on the Lovell Island range, the two red conical range towers on Spectacle Island (the island westward of Long Island Head) should be looked for. When black can buoy No. 5 is a little abaft the beam, the high, bluff, northern end of Great Brewster Island will be on the port beam and the course is then changed to **W.** ¾ **S.**

On the **W.** ¾ **S.** course Ram Head lighted buoy (black) will be left 200 yards on the port hand, and Deer Island Lighthouse will be distant ¼ mile when abeam. There are two white pyramidal towers on the north end of Spectacle Island which form the range for standing up the harbor above the Lower Middle. Nix Mate beacon will be broad off the port bow, and a little over ⅝ mile distant when abeam.

The northern edge of the Broad Sound South Channel is marked by three red nun buoys, Nos. 2, 4, and 6. No. 2 is at the northern end, No. 4 at the point where the vessel changes to the Spectacle Island range beacons, and No. 6 at its western end.

Dangers.—**The Graves** are described on page 56.

Maffitt Ledge, a small, detached spot with 16 feet over it, lies about ¼ mile **NNW.** ¾ **W.** from Green Island.

Roaring Bulls are a number of detached rocks extending about 700 yards in an **ENE.** and **WSW.** direction, and several of them show bare at low water and are usually marked by breakers. Their southwestern end lies ⅝ mile **E.** from Green Island, and their northeastern end about ½ mile **SW.** ¾ **W.** from The Graves.

Commissioners Ledge, two small, detached spots with 13 and 16 feet over them, lies ½ mile **NW.** ¼ **W.** from Green Island. To avoid this ledge, Long Island Head Lighthouse should be kept bearing a little southward of **WSW.** until the northern end of Green Island bears **SE.** by **E.** ¼ **E.** The ledge is marked off its western side by a buoy (can, black, No. 1).

Great Faun and **Little Faun** bars are described under section 1 C, following. A 9-foot spot lies near the eastern extremity of Little Faun Bar, 1¼ miles **E.** ⅝ **N:** from Deer Island Lighthouse; it is marked by a buoy (can, red and black horizontal stripes).

There are **a number of detached spots** with 14 to 18 feet over them, lying eastward and southward of these bars and on the northern edge of the Broad Sound South Channel.

Devils Back, between 300 and 400 yards long, is occasionally bare in places at low water; it lies ⅝ mile **W.** from Green Island, and is marked off its north end by a buoy (can, black, No. 3).

Aldridge Ledge has 3 feet over it at its western part, and lies 1⅝ miles **NNE.** from Narrows Lighthouse and 1¼ miles **E.** from Deer Island Lighthouse. Near the western side is a buoy (can, black, No. 5).

Ram Head is the extensive shoal making off northeastward from Lovell Island; a large part of this shoal is bare at low water, and only 6 feet of water is found ¼ mile from the island. On its northern side the shoal is marked by a buoy (black, gas-lighted). The **northern edge of the shoal** making northward from Lovell Island, and westward of Ram Head, is marked by a buoy (spar, black, No. 9).

Deer Island Point, near the southern end of which is Deer Island Lighthouse, is described under section 1 C.

Nix Mate is described under section 2, page 59.

1 C. ***Approaching and entering, through Broad Sound North Channel to President Roads.—I. From Lynn Harbor or Nahant.***—Stand southward, keeping well off the entrance until Deer Island Lighthouse bears **WSW.** ¼ **W.**, when steer for it on that bearing, leaving the bell buoy and red nun buoy, No. 4, about 75 yards on the starboard hand. When red buoy No. 4 is abeam steer **SW.** by **W.** ¼ **W.** so as to pass ¼ mile south of Deer Island Lighthouse, and when the lighthouse bears *N.* steer **W.** ¾ **N.** until the Spectacle Island Range bears *SE.* ½ *S.* Then steer **NW.** ½ **N.**, and follow the directions under section 3, page 59.

Or, when Deer Island Lighthouse bears *N.* steer about **WNW.** ¼ **W.** and anchor anywhere from ½ to 1¼ miles westward of it.

Remarks.—The directions are good for a draft of 9 feet at low water with a smooth sea.

When approaching Great Faun Bar bell buoy, the beacon on Great Faun Bar will be seen well westward of the buoy. The red buoys and black buoys, marking the edges of Broad Sound South Channel, and the can buoy (red and black horizontal stripes), marking the 9-foot shoal near the eastern part of Little Faun Bar, will be seen southward. As Deer Island and Long Island Head lighthouses are approached, Nix Mate beacon and the buoys at the northwestern end of the Main Ship Channel will be seen southward.

Vessels of 15 feet or less draft can, at high water with a smooth sea, stand directly in for Long Island Head Lighthouse bearing **SW.** by **W.** ¼ **W.**

Dangers.—**Great Faun Bar** extends eastward from the middle of Deer Island for a distance of nearly ¾ mile, where it is marked by a beacon (square stone base and cone, with red iron spindle and cage on top); the bar is dry at low water. The shoal water extends a distance of 1 mile eastward of the beacon and a red bell buoy is placed ¾ mile eastward of the beacon as a guide over the bar, where the least depth is 12 feet.

Little Faun Bar makes eastward from near the southern end of Deer Island. A buoy (nun, red, No. 4) is placed on a part of the bar having about 15 feet over it and about ½ mile eastward of the island. The bar is partly dry between the buoy and the shore, and with exception of the 9-foot spot (8-foot spot) marked by a buoy, has least depths of 11 feet eastward of buoy No. 4.

Deer Island Point is a long spit, dry at low water, extending ¼ mile southward from the southern end of Deer Island. Near its southern end it is marked by Deer Island Lighthouse (see table, page 14). Shoals extend 300 yards eastward and 150 yards southward from the lighthouse, and northeastward to Little Faun Bar.

II. From northeastward.—When Long Island Head Lighthouse is made, bring it (while still well off the entrance) to bear **SW.** by **W.** ¼ **W.** and steer for it until Deer Island Lighthouse bears **WSW.** ¼ **W.** Then steer for Deer Island Lighthouse, keeping it bearing **WSW.** ¼ **W.** until up to Great Faun Bar bell buoy, from which follow the directions given in paragraph 1, foregoing.

Or, from the whistling buoy off The Graves bring Deer Island Lighthouse to bear **WSW.** ½ **W.** and steer for it on this bearing, and follow the directions in paragraph 1, preceding.

Remarks.—Standing on the **SW.** by **W.** ¼ **W.** course for Long Island Head Lighthouse, a black whistling buoy northeastward of The Graves will be left nearly 1 mile on the port hand.

See also the remarks and dangers under paragraph 1, foregoing.

The Graves are described under section 1, page 56.

2 A. ***From the Main Channel Entrance to an Anchorage in Nantasket Roads.***—Having followed the directions in section 1 or 1 A, pages 56–57, and when nearly ½ mile south of Boston Lighthouse, steer **W.** ¼ **N.** until the range beacon southward of Boston Lighthouse is in range with the lighthouse and Deer Island Lighthouse is seen on the high-water mark of the southwest end of Lovell Island; then steer **WSW.**, keeping Boston Lighthouse and beacon in range over the stern. When the eastern end of Georges Island closes on the west end of Lovell Island, haul westward and anchor south of Georges Island, keeping Narrows Lighthouse open southward of the island.

If of less than 18-feet draft, when following the above directions, Long Island Head Lighthouse bears **NW.** ½ **N.** steer for it and anchor anywhere ¼ mile southwestward of Georges Island. The best anchorage is in 3½ to 5 fathoms, ¼ mile westward of Georges Island.

At night.—When nearly ½ mile south of Boston Lighthouse steer **W.** ¼ **N.** until the first red sector of Boston Light (auxiliary light) is crossed; then stand **WSW.** ¼ **W.**, keeping in the white rays of the auxiliary light until Long Island Head Light bears **NW.** ½ **N.**, when steer for it and anchor southwestward of Georges Island.

Remarks.—The **W.** ¼ **N.** course leads about 300 yards northward of Hunt Ledge buoy (nun, red and black horizontal stripes), and when the buoy is abaft the beam the course is changed to **WSW.**

On the **WSW.** course the northwestern end of Peddock Island will be a little on the port bow; two red spar buoys (Nos. 2 and 4) will be left on the starboard hand, and Hunt Ledge buoy and a black can buoy on the port hand. When past these buoys Nantasket Gut will be opened out between Peddock Island and Windmill Point. The white rays of the auxiliary light can be seen only when in the channel for Nantasket Roads.

Dangers.—**Nash Rock Shoal** and **Hunt Ledge** are described on pages 58–59.

A spot, with 16 feet over it and marked by red spar buoy No. 2, lies nearly ¼ mile **S.** from Narrows Lighthouse, and a 14-foot spot, marked by red spar buoy No. 4, lies 350 yards westward of it.

Hospital Shoal, with a least depth of 7 feet on it, lies ¼ mile **WSW.** ¼ **W.** from Georges Island, and is marked on its eastern side by a buoy (can, black, No. 1).

3 A. ***From an Anchorage in Nantasket Roads or Westward of Georges Island to President Roads.—I. To pass between Georges and Gallup islands.***—The turn around the eastern end of Gallup Island is too sharp and the channel too narrow for any but a quick-working vessel to attempt to enter The Narrows between Georges and Gallup islands.

Stand northward or northeastward, giving the western shore of Georges Island a berth of 200 yards on the starboard hand, and stand into The Narrows, giving the eastern point of Gallup Island a berth of 200 yards. When Nix Mate beacon shows open eastward of the end of Gallup Island, haul sharply northward and westward, and steer about **NW.** ¾ **N.** with Deer Island Lighthouse a little on the port bow. Leave the bell buoy and Nix Mate

beacon on the port hand, and when well past them steer **W.** ¾ **N.** into President Roads, and if bound up to the city follow the directions in section 3, page 59.

II. To pass through the dredged channel between Long Island and Nix Mate.—Steer for Long Island Head Lighthouse bearing **NW.** ½ **N.** until Deer Island Lighthouse bears **N.** ¾ **W.**, and then steer for the latter on the bearing until up to red spar buoy No. 2. When up to this buoy leave it 30 yards on the starboard hand and steer **NNW.**, leaving black can buoys Nos. 1 and 3 on the port hand, and red spar buoy No. 4 on the starboard hand. When well past these buoys haul westward so as to pass about ¼ mile northward of Long Island Head; then if bound to the city follow the directions in section 3, page 59.

Remarks.—The channel between Long Island Head and Nix Mate is only about 200 feet wide and 14 feet deep.

3 B. *From President Roads through Governors Island Channel to the City of Boston.*—This channel is narrow and tortuous near its western end and is little used by strangers; 17 feet can be carried through if the buoys are closely followed.

With Long Island Head Lighthouse bearing *S.*, distant ¼ mile, steer **NW.** ¾ **W.** for ⅞ mile, until red spar buoy No. 2 is about 300 yards distant on the starboard beam. Then steer **N.** by **W.** ¾ **W.** for the highest part of Apple Island, and pass about 100 yards westward of red spar buoy No 4, on the Middle Ground, and about 100 yards northeast of black spar buoy No. 1. Then steer **NW.** ¾ **W.** and pass close southward of red spar buoy, No. 8, marking Apple Island Flats.

When past red spar buoy No. 8, haul a little northward and leave black spar buoy No. 3 on the port hand. When Glade Flats beacon bears *SW.* by *S.*, haul sharply southward, course about **SW.** by **S.**, and leave the beacon and black spar buoy, No. 5, on the port hand and Bird Island Flats spindle and red spar buoy, No. 12, about 125 yards on the starboard hand. When buoy No. 5 is abaft the port beam, steer **W.** ¼ **N.** about ⅜ mile until in the middle of the Main Ship Channel, and then haul northward (course about **NW.**) and stand up the harbor; anchor within the limits prescribed in the harbor regulations (see Appendix II).

Remarks.—Vessels of less than 15 feet draft may bring Deer Island Lighthouse to bear **SE.** by **E.** and steer **NW.** by **W.**, passing about 300 yards northward of red spar buoys Nos. 2 and 4. The channel is well buoyed, and the buoys should be closely followed.

On the **NW.** ¾ **W.** course Bunker Hill Monument will be a little on the starboard bow, and will be brought a little on the port bow after passing red spar buoy No. 8.

Dangers.—Middle Ground, with 7 to 17 feet over it, lies ⅝ mile **WNW.** from Deer Island Lighthouse; it is ¼ mile long in a **WNW.** ½ **W.** and **ESE.** ½ **E.** direction and has a greatest width of about 300 yards, near its eastern end. A buoy (spar, red, No. 2) marks the shoal near the middle at its southern side, and a buoy (spar, red, No. 4) marks its western extremity. Eastward of buoy No. 2 the depth on the shoal ranges from 15 to 17 feet. Between buoy No. 4 and Governors Island Flats a channel 250 yards wide leads from President Roads into Governors Island Channel.

Governors Island Flats, partly dry at low water, extend 1⅛ miles in a **SE.** by **E.** direction from the eastern shore of Governors Island. A buoy (spar, red, No. 2) marks the flats at their southern edge and a buoy (spar, black, No. 1) at their northeastern extremity.

Deer Island Flats make out from the western shore of Deer Island. They have a depth of 3 to 10 feet over them and extend a little over ¼ mile **WSW.** ¼ **W.** from the northwestern point of Deer Island; a depth of 5 feet is found near the western extremity of these flats.

Apple Island Flats is the name given to the mud flats surrounding Apple Island. The greater part is dry at low water, and the southern edge rises abruptly from the deep water of Governors Island Channel. A buoy (spar, red, No. 8) marks their southern edge nearly ¼ mile **WSW.** from Apple Island, and from here the edge of the flats makes ⅞ mile in an **ESE.** direction to red spar buoy No. 6, which marks their southeastern point, ⅝ mile **SSE.** ¾ **E.** from Apple Island. A channel about 200 yards wide, leading to Shirley Gut and north of Apple Island, makes between this buoy and Deer Island Flats. A shoal, with 4 feet near its outer point, extends nearly ¾ mile **WNW.** ¾ **W.** from Apple Island.

Noddle Island Flats, partly dry at low water, make out from the southeastern point of East Boston in an **ESE.** direction to a point about 400 yards north of Apple Island. A buoy (spar, red, No. 10) marks the southernmost point of this shoal.

A narrow channel leads from Governors Island Channel north of Apple Island along the southeastern edge of Noddle Island Flats.

Shoals make out about ¼ mile northward and westward from the western end of Governors Island. They are marked at the northern end by a buoy (spar, black, No. 3), at the northwestern side by Glade Flats beacon, and near the western point by a buoy (spar, black, No. 5). These buoys and the beacon will be left close-to on the port hand. That part of the shoals which is dry at low water is known as **Glade Flats.**

NEPONSET RIVER*

is the first river emptying into Boston Harbor southward of South Boston, and leads to **Neponset** and Milton. The approach to the river from the Main Ship Channel in Boston Harbor leads along the northwestern side of Thompson Island between extensive mud flats, which rise abruptly from the edge of the channel and are bare or nearly bare at low water. The river is ¼ mile wide at its mouth, but grows gradually narrower until, at Milton, it is only 100 yards in width. **Milton** is 2½ miles above the mouth of the river in a straight line, but nearly 3½ miles by the windings of the river. The southern boundary of the city of Boston extends to the north bank of the Neponset River. At mean low water the least depth in the channel, as far up as **Commercial Point,** at the mouth of the river, is 12 feet; as far as Neponset, 7 feet; and to Milton, the head of navigation, 4 feet. The deepest draft that can be taken into the river is 20 feet; the greatest draft taken up to Milton is 12 feet.

The channel below Neponset is buoyed. At Neponset, where the first bridge crosses the river, there are shifting, middle grounds, and above the third or granite bridge there are rocks along the edge of the channel.

Pilots are generally taken by strangers, and may be had by making signal off Thompson Island, at the mouth of the river, anchoring there if necessary; they are not always taken by light-draft vessels bound to Neponset. Pilotage is not compulsory; the rates for the lower part of the river are given in Appendix II.

Towboats are taken by most vessels in going up and down the river, the master of the tug doing the piloting below Neponset bridge, where, if bound for Milton, a special pilot is taken and the vessel being towed pays his pilotage.

The **harbor regulations,** etc., are the same as for Boston Harbor (see page 52 and Appendix II).

Ice forms over the river in winter, extending to its mouth and beyond.

The **tidal currents** set fair with the direction of the channel as a rule, below Neponset; above this the currents are irregular.

SAILING DIRECTIONS, NEPONSET RIVER.

The following directions will lead to an anchorage westward of Thompson Island with a least depth of 12 feet at low water. Here a pilot or towboat should be taken by strangers bound up the river.

From President Roads to the Anchorage.—Having entered Boston Harbor as directed in the sailing directions under that heading to a position ¼ mile north of Long Island Head Lighthouse, steer **W. ¾ N.** through President Roads until the western end of Spectacle Island bears *S.* by *W.* ¼ *W.* Then steer **WSW.**; leave Old Harbor Shoals buoy (spar, red, No. 2) about 100 yards on the starboard hand, and continue the course so as to pass about midway between Old Harbor buoy (spar, red, No. 4) and Thompson Island Flats buoy (spar, black, No. 3). When abreast these buoys steer about **SW. ½ W.** and anchor in 14 to 17 feet water northeastward of Cow Pasture Flats buoy (spar, red, No. 6).

Remarks.—The channel leads between shoals with 2 and 3 feet over them in places at low water. The only guides easily recognized by a stranger are the buoys. On the **WSW.** course red buoy No. 2 should be made a little on the starboard bow and Spectacle Island will be left ¼ mile on the port hand; Commercial Point will be a little on the port bow, and a tall smokestack will be a very little on the starboard bow; the northern shore of Thompson Island will be left well on the port hand. On the **SW. ½ W.** course red spar buoy No. 6 will be a little on the starboard bow.

QUINCY BAY.*

This large but shallow bay indents the southern shore of Boston Harbor eastward of Neponset River. On the west it is separated from that river by the peninsula of Squantum, and on the east Hough Neck separates it from Weymouth Fore River. Its shores are mostly low and gently sloping toward the water, but

* See footnote on page 49.

high, steep hills will appear behind and over the low lands; the highest summits are those of Mount Hope, Forbes Hill, and Presidents Hill. The town of **Quincy** is situated about 1 mile inland from the shores of the bay, near its eastern end. It has no communication by water with the bay, but there is a small frontage on a narrow stream emptying into Town River Bay.

The peninsula of **Squantum** extends from the mainland about 1 mile in a **ENE.** direction and has a general width of about ⅜ mile. It is bare of trees and hilly with the exception of its western end, where it joins the mainland, which is almost entirely composed of salt meadows.

Eastward of Squantum and connected with the peninsula by a causeway lies **Moon Head.** It is a narrow island, easily recognized by the precipitous head on its eastern end.

Eastward of Moon Head, and between it and the southwestern end of Long Island, lies the entrance to Quincy Bay from westward. From here the Back or Western Way leads in a **NNW.** direction between Spectacle Island and Thompson Island into the Main Ship Channel, and the **Sculpin Ledge Channel** in a **NE.** direction following closely the western shore of Long Island into President Roads.

Hough Neck extends from the mainland about 1¼ miles in a general **NNE.** direction. It is of irregular shape and moderate height, has a smooth surface, and its eastern slope is covered with houses. At its northeastern end it terminates in a smooth, green hill 100 feet high, with steep faces, called **Quincy Great Hill.**

About 200 yards northward of Hough Neck and connected with it by a causeway lies **Nut Island,** a small islet. The channel into Weymouth passes between this island and Peddock Island. **Hangmans Island** is a small, rocky islet lying in the bay nearly midway between Moon Island and Nut Island; on it are several fishing huts.

HINGHAM BAY AND TRIBUTARIES.*

HINGHAM BAY

is that part of Boston Harbor lying southeastward of Peddock Island and southward of the shore running west from Point Allerton to Windmill Point; on the east it is separated from Boston Bay by Nantasket Beach. It is the approach to Weymouth Fore River, Weymouth Back River, Hingham Harbor, and Weir River. The eastern part of the bay is shoal, and extensive shoals, between which the narrow channels of the tributaries of the bay lead, make out from the southern shore and surround the islands in the southern part of the bay.

Sheep Island is a small, low, bare islet with a hut on top of it, and lies near the middle of the bay about 1⅝ miles **S.** by **W.** ¾ **W.** from Windmill Point; it is surrounded by a nearly circular shoal about ¼ mile in diameter.

Grape Island lies near the southern shore of the bay, ¼ mile from Lower Neck, the northern point of the peninsula between Weymouth Back River and Weymouth Fore River. The island is about ½ mile long **E.** and **W.** and has a saddle-shaped appearance from northward, with a house standing in the hollow near the middle.

Slate Island is a small island which lies nearly 300 yards eastward of Grape Island.

Bumkin Island lies ⅞ mile **ENE.** from Grape Island. It is ⅝ mile long in a **ESE.** and **WNW.** direction, is about 80 feet high and bare of trees. There is a large yellow building on the island, and a wharf on the south side.

Little Hog Island is a small island in the northeastern part of the bay. The bight northeastward of it is very shoal, and shoals with 1 to 10 feet extend in a **SE.** and **NW.** direction from the island to the shore.

The principal entrance, **Nantasket Gut,** is a narrow but deep channel between the northeastern end of Peddock Island and **Windmill Point** and leads directly from Nantasket Roads into the bay. Windmill Point Post Light (see table, page 12) is on the southern end of the point. Prominent on Windmill Point is a large hotel, with steamboat landing southward of it. This is the terminus of the Nantasket Beach Railroad. Eastward, on the slopes of the hills, is the town of **Hull** and the clubhouses of the **Hull yacht clubs.** The usual and **best anchorage** is off the steamboat landings at Hull. There is also an entrance southward of Peddock Island; this is sometimes used by vessels bound into Weymouth Fore or Weymouth Back rivers.

The **tidal currents** in Nantasket Gut have considerable velocity, but generally follow the direction of the channel. The flood sets southward and the ebb northward.

Sailing directions for entering the bay are given in connection with its tributaries.

WEYMOUTH FORE RIVER

empties into Hingham Bay eastward of Hough Neck, Quincy Great Hill being on the western side of the entrance and Grape Island on the eastern. It is quite wide at its mouth, but above is very variable in width and is somewhat crooked, but extends in a general **SW.** direction for about 4 miles to **Weymouth** and **East**

*See footnote on page 49.

Braintree, near the head of navigation. About 2½ miles above its mouth it is crossed by Quincy bridge (width of draw 100 feet), and at East Braintree by another bridge (width of draw 35 feet).

It is the approach by water to **Quincy Point, Weymouth**, and **East Braintree**, and to a number of landings on its banks.

The channel is narrow and crooked, but at high water a draft of 25 feet can be taken a little above Quincy bridge to the Fore River Ship and Engine Company's shipyard at Quincy Point, and 5 feet thence to East Braintree at low water.

Town River Bay makes in on the northwestern shore of Weymouth Fore River north of Quincy Point. It is full of shoals, but has a narrow channel with some deep holes; it is not safe for strangers. On its northern side near the entrance is **Sailors' Snug Harbor. Town River** empties into the bay nearly 1 mile above Quincy Point. It is a small creek, very crooked and shoal. The channel through the bay and river has been dredged, so that 4 feet may be taken at low water to the landings at Quincy.

Pilots are always taken by vessels going up Weymouth Fore River above Quincy bridge, and are obtained either at Nantasket Gut or at Quincy Point; in the former case, after making signal, vessels anchor between Nantasket Gut and Sheep Island, if it is necessary to wait for a pilot.

Towboats are employed by all large vessels entering the river, being generally taken from Boston; light-draft vessels sometimes sail up if the wind is fair.

Repairs.—The shipyard at Quincy Point has facilities for the construction and repair of the largest ships and engines of steamers.

Supplies.—Provisions can be obtained at Quincy, Weymouth, and East Braintree. Fresh water can be had at Quincy Point and at Weymouth Landing, alongside of wharves.

Ice.—The river freezes over down to Quincy Point, and in extremely cold winters the ice extends as far as Hull.

Tides.—The mean rise and fall of tides is about 9 feet.

WEYMOUTH BACK RIVER

empties into Hingham Bay just eastward of Weymouth Fore River, from which it is separated by Lower and Eastern necks; it is narrow, crooked, and its upper part shallow, about 3 miles in length, and of some importance. Directly across its mouth lie Grape and Slate islands, which are nearly connected at low water.

Two channels lead into the river, one narrow and crooked, with a depth of 10 feet, from eastward leading southward of **Slate Island**; the other, with a depth of 18 feet, from westward leading southward of **Grape Island**; the latter channel is buoyed, and is the one used. The channel is very narrow, but about 10 feet at low water can be carried up to Bradley Fertilizer Company's wharves.

Vessels entering this river, unless well acquainted, should take a pilot.

For directions in approaching see the sailing for Weymouth Fore River.

HINGHAM HARBOR AND WEIR RIVER

are shallow, irregular bodies of water making into the mainland in the southeastern corner of Hingham Bay. Their common entrance from the bay lies westward and leads close to **Bumkin Island.** The channel, 250 yards wide, and having a depth of over 3 fathoms, leads for ½ mile in a southeast direction from the western end of Bumkin Island to East Crow Point Flats buoy (spar, red, No. 2), where the channel shoals and branches. The branch leading eastward takes the name of **Weir River.** The channel leading to Hingham Harbor follows a general south direction, is narrow, and has a depth of 18 feet up to Crow Point (Downer Landing), the entrance of the harbor.

Hingham Harbor is a cove 1 mile long, with an average width of about ⅝ mile. At low water it is a dry flat, through which a narrow and tortuous channel winds, leading up to the long wharf built out from the southeastern shore at the town of Hingham. The depth in the channel at low water is 10 feet at the outer wharf.

Crow Point (Downer Landing), the western point, at entrance to the harbor, is a high, bare hill with a steep face northward. A steamboat landing is built out from its eastern end to the edge of the channel.

Planters Hill, the eastern point at the entrance to the harbor and lying ⅝ mile E. from Crow Point, is a high, smooth, grassy hill, with a few trees and a bluff face on its western side.

Three small islands lie just inside of the entrance of the harbor; the northern or outer one is **Langlee Island,** and the channel leads between it and **Ragged Island** and **Sailor Island,** which lie just southward.

Weir River leads between **World End**, a high peninsula northward of Planters Hill, and a narrow spit of land making out about 1 mile westward from the south central part of Nantasket Beach, and then extends in a southeasterly direction for about 1½ miles. It is more of an inlet than a river, and is composed mostly of extensive flats bare at low water, through which a narrow channel leads to **Nantasket Pier**, on the western side and near the southern end of Nantasket Beach. This channel has a least width of 100 feet and least depth of 10½ feet from the entrance to Nantasket Pier.

The channel is used by the steamers running from Boston to Nantasket Beach, and it is marked by piles or stakes, but it is so narrow that a stranger should not attempt it.

Directions for approaching the entrance are given in "Sailing Directions, Hingham Harbor." The tidal data for Hingham Harbor and Weir River is about the same as for Boston Lighthouse (see table, page 11).

SAILING DIRECTIONS, HINGHAM BAY AND TRIBUTARIES.

A depth of 4¼ fathoms can be taken through Nantasket Gut, and about 3½ fathoms South of Peddock Island into Hingham Bay. The directions are good for vessels of 16 feet draft at about half tide; deeper-draft vessels should take a pilot.

1. ***From Nantasket Roads to an anchorage in Hingham Bay.***—Follow the directions in section 2 A, page 62, until Nantasket Gut is opened, then haul southward and pass through it on a course about **S.** by **E.**, giving the high-water mark of Windmill Point a berth of 150 yards. When through Nantasket Gut good anchorage will be found southward of and close under Windmill Point, or in 4½ to 7½ fathoms ¼ mile *S.* by *W.* from the hotel on the point.

If bound into any of the tributaries of the bay, anchor and signal for a pilot or proceed, according to destination, as directed in paragraphs I or II, following.

Dangers.—**Shoals** make off 200 yards northward and northeastward from Peddock Island.

A small **16-foot spot** lies nearly in the middle of the channel of Nantasket Gut and about 120 yards from the west end of Windmill Point.

I. From Hingham Bay into Weymouth Fore or Weymouth Back rivers.—When through Nantasket Gut, bring the large hotel on Windmill Point to bear *NE.* by *N.* and steer **SW.** by **S.** until Sheep Island bears *E.* ¾ *S.*, distant about 600 yards, and the beacon on Pig Rocks is the same distance forward of the starboard beam. Then change the course to **S.** by **E.** for the western end of Grape Island, leaving Sheep Island a little over ¼ mile on the port hand, and when the western end of Sheep Island bears *NE.* ½ *N.* steer **SW.** ½ **S.** This course made good for a little over 1¼ miles will lead 100 yards westward of black spar buoy No. 1 and about 100 yards eastward of red spar buoy No. 2. When the latter buoy is abeam haul a little more westward so as to pass 100 yards southward of the red and black horizontally striped buoy marking Channel Rock off the eastern edge of the shoal making out from Gull Point. Leave the last-mentioned buoy 100 yards on the starboard hand, steer **W.** ¾ **N.** and anchor in the channel 250 yards west of the buoy in 4½ fathoms. The least depth on the sailing lines to this point is 17 feet; farther up, the channel is very crooked and local knowledge is necessary.

If bound into Weymouth Back River follow the directions above until nearly ⅜ mile west of Grape Island, and abreast the entrance, when take a pilot.

Remarks and dangers.—On the **SW.** by **S.** course with the large hotel on Windmill Point astern, Pig Rock beacon will be on the starboard bow. Sheep Island, which is surrounded at low water by a large, bare shoal with bowlders, will be on the port bow. The course leads 300 yards eastward of **Harrys Rock**, a cluster of bowlders showing at low water, extending 500 yards southeastward near the middle of Peddock Island. The western end of Sheep Island should be given a berth of about 450 yards.

Prince Head is a small island nearly ⅝ mile **NW.** ½ **W.** from Sheep Island, and is off the south side of, and connected at low water with Peddock Island. A shoal extends nearly 500 yards eastward from Prince Head.

Sheep Island is surrounded by a shoal, with 6 to 8 feet over it, which extends about ⅝ mile in a northeasterly and northerly direction from the island, and rises abruptly from depths of 3½ and 4½ fathoms. On the western side of Sheep Island 18 feet can be carried as close as 400 yards from it.

On the **S.** by **E.** course the western end of Grape Island, which is a bluff about 20 feet high, rising to a round, smooth, grassy hill 80 feet high, will be ahead. The course leads between the shoals surrounding Sheep Island and those making eastward from Hough Neck. A red spar buoy will be seen broad off the port bow.

Extensive shoals make northeastward and eastward from Hough Neck, a depth of only 6 feet being found ¾ mile eastward from **Quincy Great Hill.** A little over ½ mile **ENE.** ½ **E.** from this hill, and near the northern edge of the shoal is **Pig Rock,** marked by an openwork beacon with granite base, surmounted by a black staff and cage.

The channel southward of Sheep Island leads between shoals on both sides, but a useful description of them can not be given.

On the **SW.** ½ **S.** course, with the high-water mark on the west end of Sheep Island astern, the highest point of the hill at Hull will show over Sheep Island; the standpipe on Nantasket Hill will be seen eastward of Hull. The course leads nearly 300 yards westward of the red spar buoy at the entrance to Weymouth Back River, and Jackknife Ledge buoy (spar, black, No. 1) will be made a little on the port bow. After passing this buoy and red spar buoy No. 2, Channel Rock buoy should be seen on the starboard bow; the channel is quite narrow southward of this buoy and the buoy should be given a berth of 100 yards. The anchorage westward of the buoy is about 225 yards wide between the shoals.

II. Through Hingham Bay to Hingham Harbor and Weir River entrance.—Entering Hingham Bay as directed is section 1, preceding, continue the **S.** by **E.** course, leaving Bumkin Island Shoal buoy (can, black, No. 1) about 200 yards on the port hand, and when the north end of Sheep Island is abeam bearing *W.* by *S.*, steer **SE.** ¾ **S.** Pass 200 yards westward of Bumkin Island, and leave Bumkin Island buoy (can, black, No. 3) about 100 yards on the port hand; continue the course nearly ½ mile past this buoy, and anchor 200 yards *NNE.* from red spar buoy No. 2, marking the entrance to Hingham Harbor.

If bound to Hingham or to Weir River take a pilot.

Dangers.—Bumkin Island Shoal makes off nearly ¾ mile in a northwesterly direction from Bumkin Island and is marked at its northern extremity by a buoy (can, black, No. 1).

Crow Point Flats are very shoal and extend 1¼ miles in a northerly direction from Crow Point, their eastern edge forming the western edge of the channel into Hingham Harbor; the eastern edge of the channel is formed by the extensive flats making westward for ½ mile from World End and Planter Hill. These shoals rise abruptly from the channel which leads between them.

1 A. ***Approaching and Entering Hingham Bay or Weymouth Fore River, from Northwestward, Passing South of Peddock Island.—I. From Boston by the Back or Western Way.***—The following directions are good for about 8 feet at low water:

Pass 200 yards eastward of Castle Rocks buoys (a black bell and black can close together) and steer about **S.** ½ **E.** for the eastern end of Moon Head. When about midway between the north ends of Spectacle and Thompson islands and the middle of Fort Independence (on Castle Island) bears *NNW.* ⅜ *W.* steer **SSE.** ⅜ **E.,** keeping the fort on the bearing astern and heading so as to pass 300 yards from the southwestern end of Long Island. Leave red spar buoy No. 4 off the end of Long Island about 100 yards on the port hand, and continue the course so as to leave Sunken Ledge beacon at least 300 yards on the port hand. Having stood on the course ½ mile after passing the beacon, red spar buoy No. 4 should be left 300 yards on the starboard hand, and when the north end of *Nut Island* (small island with causeway to Quincy Great Hill) is on the starboard beam, steer **ESE.** ¼ **E.** for Sheep Island and pass 300 yards north of Pig Rock beacon. Then—

If bound into Weymouth Fore or Weymouth Back rivers continue the **ESE.** ¼ **E.** course for Sheep Island until the western end of Grape Island bears **S.** by **E.,** when steer for it and follow the directions in paragraph I, page 67.

If bound into Hingham Bay, when Pig Rock beacon bears *SW.* by *W.* ¼ *W.* steer **NE.** by **E.** ¼ **E.,** keeping the beacon on the bearing astern. Then, if bound into Hingham Harbor or Weir River, steer for Bumkin Island Shoal buoy (can, black, No. 1) when it bears **E.,** and when 300 yards from it steer **S.** by **E.** until the north end of Sheep Island is abeam; then follow the directions in paragraph II, under section 1, preceding.

II. From President Roads by the Sculpin Ledge Channel.—With the wharf on the western side of Long Island, ½ mile from its northern end, bearing between **S.** by **W.** ½ **W.** and

SE. ½ **S.** steer for it; as it is approached change the course so as to pass about 400 yards westward of it and then steer **SW.** by **S.** for Sculpin Ledge buoy (spar, red, No. 2). Leave this buoy close-to on the starboard hand and steer **SW.** ¾ **W.**; round the southwestern end of Long Island at a distance of 300 yards and when the end of the island bears *E.* steer **SSE.** ⅝ **E.** and follow the directions in paragraph I, foregoing.

Dangers.—The directions above (paragraphs I and II) are intended only for vessels of 8 feet or less draft, and a detailed description of all the shoals would be of no particular value.

Sculpin Ledge, a long reef with 1 to 10 feet over it, lies about midway between the southwestern end of Long Island and Spectacle Island. Its eastern end is marked by Sculpin Ledge buoy (spar, red, No. 2).

Sunken Ledge, dry at low water, and lying over ½ mile **NW.** from the western end of Peddock Island, is marked by an openwork beacon, with granite base, surmounted by a black staff and cage.

About ½ mile **WSW.** from Sunken Ledge beacon is **Hangmans Island,** low, with several huts on it and bare rocks and shoals around it.

Wreck Rock, a sunken rock with 6 feet over it, near the end of the shoal making out about ¼ mile in a **N.** by **W.** ½ **W.** direction from Nut Island, is marked off its eastern side by a buoy (spar, red, No. 4).

COHASSET HARBOR.*

The coast from Point Allerton extends in a general **S.** by **E.** ¾ **E.** direction for 3 miles and is known as **Nantasket Beach.** It is a low and narrow strip of land separating Boston Bay from Hingham Bay. There are three smooth and grassy hills on this beach, the most prominent of which is **Strawberry Hill** (about 1 mile southward of Point Allerton), which can be easily recognized by the tall, dark, round water tower on its top; the other two hills to the southward are **White Head** and **Sagamore Head.** Houses show scattered along the entire length of the beach. From Nantasket Beach the coast, presenting a general hilly appearance, although intersected by creeks and marshes, extends 3 miles in a general **ESE.** direction to Cohasset Harbor. Rocks and sunken ledges are found ½ mile off the shore along the coast between Nantasket Beach and Cohasset Harbor.

Cohasset Harbor is formed by a large but shallow cove of irregular shape which makes into the shore on the western side of Strawberry Point, the entrance lying 5 miles **SE.** from Point Allerton. The harbor is of little commercial importance, but is the resort of a number of small yachts.

Anchorage in 8 to 10 feet can be found in the so-called outer harbor, but the inner harbor is almost entirely composed of flats through which a narrow channel, with 3 feet at mean low water, but only 1 foot over the bar, leads from the outer harbor to the wharves of **Cohasset,** situated on the southwestern shores of the harbor.

The most conspicuous object approaching this harbor is **Minots Ledge Lighthouse** (see table, page 12), built on the **Outer Minot,** the most northerly of the Cohasset Rocks.

Strawberry Point, the point on the eastern side of the harbor, is a low cleared point with houses scattered over its surface, and is a summer resort. Numerous bare and sunken ledges with a few bare islets surround this point and render a close approach to it hazardous.

Channels.—There are three channels, the entrances to which are marked by buoys; the Western or **Brush Island Channel** enters between Brush Island Ledge and Chittenden Rock; **Gangway Passage,** leading between West Hogshead Rock and The Grampuses; and **Eastern Channel,** which leads between Enos and West Willies ledges.

A pilot should always be taken by strangers desiring to enter this harbor, as the numerous bare and sunken ledges (extending out to Minots Ledge Lighthouse) at its entrance make it difficult even for those acquainted with the locality to pass through safely.

No sailing directions of value can be given; if obliged to enter without a pilot, the chart and buoys must be the guides.

SCITUATE HARBOR.†

The coast from Strawberry Point, on the eastern side of Cohasset Harbor, extends in a general **SSE.** direction for a distance of 3¾ miles to Cedar Point, the northern point at entrance to Scituate Harbor. Seen from eastward it appears as undulating land of moderate height, thickly settled, dotted here and there with woods, but for the most part grassy and bare of trees. On the high land about 1¼ miles inland and 4 miles **S.** by **W.** ½ **W.** from Minots Ledge Lighthouse is a high, dark-gray tower with pointed top. This is a prominent landmark for this vicinity and for vessels approaching Boston Harbor from the direction of Cape Cod.

*Shown on charts **109,** scale $\frac{1}{80,000}$; **337,** scale $\frac{1}{40,000}$, price of each $0.50.

†Shown on chart **109,** scale $\frac{1}{80,000}$, price $0.50.

The entire coast from abreast of Minots Ledge Lighthouse to Scituate Harbor is rendered extremely hazardous to navigation by the large number of rocks and detached ledges lying off it, and known under the general name of **Stellwagen Ledges.** Some of these sunken ledges lie 1 mile from shore and have from 7 to 14 feet over them in surrounding depths of 4 to 9 fathoms. While in this vicinity, strangers should keep over 1¼ miles from the shore while the old light-tower at Scituate bears southward of **SW.**

Scituate Harbor is about 4¼ miles southward of Cohasset Harbor and 12¾ miles northward of Plymouth Harbor. It is easy of access, but shallow, and affords limited anchorage. The greater part of the harbor is bare at low water.

The town of **Scituate** is at the southwestern end of the harbor; it has several wharves, which are dry at low water. Two breakwaters have been built, the northern extending about 250 yards in a **SE.** by **S.** direction from the southern end of Cedar Point, and the southern about 150 yards in a southeasterly direction from **First Cliff,** on the south side of the entrance. A channel 100 feet wide and 7 feet deep has been dredged across the bar between the breakwaters at the entrance to the anchorage basin, which is 350 by 400 feet, and has a depth of 7 feet. A dredged channel about 100 feet wide and 1½ feet deep leads from the basin to the wharves of the town.

On the north point, at the entrance, is an old, unused, white light tower 44 feet high, which serves as a daymark for vessels approaching the harbor or standing along the coast, but as it is approached the white houses on the southern side of the entrance will show more prominently. The ends of the breakwaters are readily distinguished when standing in for the entrance; **Scituate Breakwater Post Light** (see table, page 14) is on the southern end of the north breakwater. Inside the harbor are two spar beacons, which mark the channel to the wharves of the town.

Pilots may be obtained by lying-to off the entrance and making signal.

Provisions and water may be obtained at Scituate, which has railway communication with Boston.

Ice.—There is no danger from ice, the harbor being kept clear by the current. The tidal currents take the general course of the channel.

Tides.—The mean rise and fall of tides is about 9.4 feet.

GENERAL DIRECTIONS, SCITUATE HARBOR.

The following directions carry a depth of about 6 feet over the bar at low water. The best time to enter is just before high water.

If northward of the entrance, keep more than 1¼ miles from the shore while the old light-tower at Scituate bears southward of *SW.* Steer for the tower on any bearing between **SW. ½ W.** through *W.* to **NNW.**

When ½ mile from the shore bring the end of the north breakwater to bear **W.** by **N.**; steer for it on this bearing and leave it 35 yards on the starboard hand. Leave the end of the south breakwater about 35 yards on the port hand, and when a short distance inside the breakwaters steer for the two beacons, which will be seen westward. Anchor well eastward of them, or, if bound to the town, take a pilot.

COAST FROM SCITUATE TO PLYMOUTH.*

The coast from Scituate Harbor to **Gurnet Point** (the northern point at the entrance to Plymouth Harbor) trends in a general **S.** by **E.** direction for about 13 miles.

From Scituate Harbor entrance to Green Harbor Point (Brant point) the distance is 7¾ miles. Four conspicuous, yellow bluffs with low beaches between them extend 2¼ miles southward from Scituate entrance.

From abreast of Green Harbor Point **Duxbury Beach** extends a distance of about 5¼ miles to Gurnet Point. For the most of this distance it is a mere strip of low, sandy beach separating Duxbury Bay from the sea.

Green Harbor Point is a low and flat headland with several higher patches of ground on which houses are built. There is quite a village here—the point having become a summer resort. **Green Harbor River** has its entrance west of the point. It makes in a general **NW.** direction, is narrow and crooked and very shoal—being closed by a bar with less than 6 feet upon it.

North River (or Marshfield Harbor, as it is sometimes called, from the village on its bank) and **South River** have their common entrance 3 miles northward from Green Harbor Point. The northern entrance to North

*Shown on charts **7**, scale $\frac{1}{400,000}$; **109, 110,** scale $\frac{1}{80,000}$, price of each $0.50.

River is through **New Inlet**, which is shoal and lies 2 miles southward of Scituate entrance and just northward of Fourth Cliff.

North River is a shallow stream, very narrow at its entrance, leading in a **NNW.** direction, and is separated from the ocean by a narrow beach. The river widens about two miles from its entrance near the steep, bare hill called **Fourth Cliff**, which is the southernmost of four yellow bluffs south of Scituate. The river is of no importance, and is only used by vessels of extremely light draft whose masters are well acquainted with the locality. **South River** is a very small, narrow, and crooked stream making southward from just inside the south entrance to North River. It is not navigable.

The coast is fairly bold-to, and 4 fathoms can be taken as close as ½ mile (and much closer in places) to the shore; but about 2 miles northward of Green Harbor Point shoals extend ⅝ mile from the shore, and off Green Harbor Point and between it and Gurnet Point are three outlying ledges, and the shore should be given a berth of 1¼ miles (see dangers under section 1, page 73).

CAPE COD BAY,*

is a large, nearly circular bay contained between the peninsula of Cape Cod on the east and south and the mainland of Massachusetts on the west. Between these limits it is about 20 miles in diameter with deep water, the soundings varying from 10 to 27 fathoms except close to the shore and in its southeastern part. **Race Point**, the northwestern extremity of Cape Cod, is the eastern, and Gurnet Point the western point at the entrance. From Race Point to Gurnet Point the distance is 16¼ miles and the bearing **W.** Within the limits of Cape Cod Bay are embraced several harbors—those of Plymouth and Duxbury on the western shore, Barnstable and Yarmouth on the southern, and Wellfleet and Provincetown on the eastern shore, all of which are treated under special headings.

Cape Cod is a long peninsula, forming the eastern extremity of Massachusetts. It makes out from the mainland, first in an easterly direction for 31 miles, and then nearly due **N.** for a little over 20 miles—this latter portion forming what is usually termed the Hook of the Cape. It is composed almost entirely of sandy lands, with high, bare sand hills, and low, nearly level plains, and is well settled. Cape Cod Bay is on its northern side, and Nantucket Sound on its southern. The name Cape Cod is also generally applied to the south coast of Massachusetts between Monomoy and Falmouth.

A **table of lighthouses** will be found on page 14, which gives the characteristics of the coast and harbor lights and their geographical positions.

Lists of the **life-saving stations** maintained between Cape Ann and Point Judith are given on pages 25–26.

Extracts from the laws of Massachusetts relating to Pilots and Pilotage, Harbor Control, and Quarantine are given in Appendix II.

Ice, and its effects in Cape Cod Bay.—As a rule parts of this bay are unsafe during the winter, owing to quantities of drift ice which, being driven out of the rivers and harbors of Massachusetts Bay, mass into heavy floes and drive down upon the southern and eastern shores of Cape Cod Bay. During very severe winters the ice "packs," and in some cases extends as far from the southern shore as a line from Wood End to Sandwich, thus closing Barnstable, Wellfleet, and Provincetown harbors, and attains the extraordinary thickness of 18 feet. This impassable barrier may remain until the return of spring, and navigation of all kinds is of course suspended. In these extreme cases, which are rare, vessels caught in the floes have been known to drift helplessly about with the pack until released by the warmer weather and consequent breaking up of the ice at the commencement of spring.

The prevailing **NW.** winds are the cause of the presence of most of the "drift" and "pack" ice, as they bring it from Boston and other harbors west of Cape Ann, and there being no southern outlet to Cape Cod Bay, the ice masses together and increases in thickness and extent. Northeasterly winds, on the contrary, tend to break up the pack, while those from **E.** to **SW.** prevent formations and remove any that may have taken place.

The **tidal current**, so far as ascertained, seems to have little or no effect upon the movements of the ice.

*Shown on charts **7**, scale $\frac{1}{400,000}$; **110**, scale $\frac{1}{80,000}$, price of each $0.50.

PLYMOUTH HARBOR,*

the most northern and western harbor in Cape Cod Bay, affords excellent and safe anchorage, and is composed of three different harbors—Duxbury Bay, Kingston Bay, and Plymouth Harbor proper. The common entrance is just southward of Gurnet Point, and is 17 miles **S.** by **E.** from Minots Ledge Lighthouse and 16¼ miles **W.** from Race Point Lighthouse.

Duxbury Bay is contained between Duxbury Beach on the east, Saquish Neck on the south, and the mainland on the west. It is of irregular shape and about 3 miles long, with an average width of 2 miles; but is full of flats, mostly dry at low water, intersected by numerous narrow channels, which are not navigable without a pilot. In the lower part of the bay there is deep water (from 3 to 6 fathoms) with good anchorage in what is called the **Cowyard.** A narrow channel, 40 to 80 feet wide, through which 5 feet may be taken, leads up to the wharf at Duxbury. Another channel leads along the western shore of Clark Island, and thence gradually approaches Duxbury Beach, which it skirts for some distance, and enters a narrow and shoal stream called **Back River.** About 7 feet at low water may be taken up to **Powder Point** (the western point at entrance to this river), but not more than 4 feet above that point. The channel is narrow and intricate and is not fit for strangers.

Kingston Bay, contained between the mainland and the western point of Duxbury Bay, has a diameter of about 1½ miles, but is so full of flats as to render it unfit for navigation except with a pilot and at high water. The village of **Kingston** is built upon its western shore (about ¾ mile back from the water) on a small stream called **Jones River.** The bay is of little importance as a harbor or port.

Several channels lead between the flats of this bay, but they are narrow and crooked. The northernmost and deepest is **Miles** or **South Channel,** and by it about 8 feet at low water can be taken to the wharf on the western side of the peninsula between Duxbury and Kingston bays.

Plymouth Inner Harbor is about 1 mile wide at its northern end, gradually narrowing for 2¼ miles to its southern end. The larger part of the harbor is dry at low water, and its narrow channels are unfit for navigation except for steamers, or at high water for vessels having pilots.

The channel, which is very narrow, first leads southward along the western side of Long Beach for nearly 1 mile, then turns abruptly at right angles westward toward the town of **Plymouth** for nearly ¼ mile, and then southeastward toward the head of the harbor for about the same distance.

In front of the city wharves a basin 866 feet long, 150 feet wide, and 9 feet deep has been dredged; and a channel 150 feet wide and 9 feet deep at mean low water has been dredged from the main channel to the north side of the basin and to the wharves at Plymouth. A draft of 7 feet can now (1902) be taken to the wharves at low water. There are none but local guides through the dredged channel.

Gurnet Point, on the southern end of Duxbury Beach and east of **Saquish Neck,** is about 80 feet in height, bare of trees, and marks the northern side of the entrance to Plymouth Harbor. On this point is **Gurnet Lighthouse and beacon** (see table, page 14.)

Captains Hill, on the peninsula between Duxbury and Kingston bays, is about 200 feet high and on its top is Standish monument, which shows prominently from all directions when approaching the harbor. **Manomet Hill,** about 5 miles southward of Gurnet Point, is over 380 feet in height, heavily wooded, and is a conspicuous landmark in approaching the entrance.

Channel.—The channel leads from the deep water southward of Gurnet Point in a westerly direction to the Cowyard, and is about ¼ mile wide until southward of Saquish Head, where it narrows to 300 yards between the 18-foot curves, and continues with this width until past Duxbury Pier Lighthouse. The aids in entering are described in connection with the sailing directions.

The deepest draft of vessels going to Plymouth is about 13 feet, which is taken in near high water. The deepest draft of those entering the Cowyard is about 13 feet; of those going to Duxbury 8 feet; into Kingston bay 8 feet. About 7 feet at mean low water can be found at the principal wharves of Plymouth.

Anchorage.—The best anchorage is in the Cowyard, but small light-draft vessels often find good anchorage under the lee of **Long Beach,** just southward of Pier Head beacon, in 3 to 4 fathoms, hard bottom.

Pilots.—There are regular pilots and one can be had by making signal when off Gurnet Point.

Towboats may be had by telegraphing to Boston and are sometimes used, if going beyond the Cowyard.

There are no special harbor regulations.

Supplies.—General supplies can be had from Boston by rail. Anthracite coal in limited quantity, water, and cordage can be obtained at Plymouth; in case of necessity, bituminous coal may be obtained from one of the factories.

Tides, see table, page 11.

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*Shown on charts **110,** scale $\frac{1}{80,000}$, price $0.50; **338,** scale $\frac{1}{40,000}$, price $0.25.

The **tidal currents** have considerable velocity, the greatest velocity being between Gurnet Point and Duxbury Pier and at the entrance to the Cowyard. The set is generally in the direction of the channel; but the ebb sets southward and eastward across Browns Bank, while the flood sets northward and westward above Saquish Head and sweeps strong around Duxbury Pier northward into the Cowyard.

Ice.—This harbor is usually obstructed every winter for a few weeks by local ice, and in January and February large masses of drift ice may be encountered, which render the approaches hazardous and makes the Outer Harbor unsafe as an anchorage. In severe winters the harbor is closed to all navigation from December to March. Westerly winds have a tendency to carry the ice out in fields (see ice, Cape Cod Bay, page 71).

SAILING DIRECTIONS, PLYMOUTH HARBOR.

These directions lead to an anchorage in the Cowyard with a least depth of about 21 feet.

Directions for approaching from Cape Ann are given on page 29. Bearings and distances from lighthouses are given on page 22, and will assist in shaping the course for Plymouth Harbor. In approaching, Gurnet Lighthouse may be steered for on any bearing between **S.** by **W.** ½ **W.** through *W.* to **NW.** until within 1 mile of it.

1. ***Approaching from Northward.***—When eastward or southeastward of Minots Ledge Lighthouse, stand southward, giving the shore a berth of at least 1½ miles until Gurnet Lighthouse is made. When this lighthouse is made keep it bearing westward of **S.** by **W.** ½ **W.** and steer so as to pass about ½ mile eastward of it. When the whistling buoy at the entrance is made, steer so as to pass it close-to on either side, and follow the directions in section 2.

Remarks.—The coast northward of Plymouth Harbor is described on page 70. Gurnet Point, marked by Gurnet Lighthouse, is described on page 72.

Dangers.—**Howland Ledge** has 7 feet over it, and lies 1⅓ miles from the nearest shore and 4¼ miles **N.** ⅝ **E.** from Gurnet Lighthouse. It is marked off its eastern side by a buoy (spar, red, No. 4), and by a red bell buoy in summer. Strangers should not attempt to pass inshore of Howland Ledge.

Bartlett Rock is a small rock, bare at low water, with depths around it ranging from 7 to 18 feet; it lies about ⅝ mile westward of Howland Ledge and is marked by a buoy (spar, red, No. 2) placed eastward of the bare rock.

High Pine Ledge has a least depth of 2 feet and shows bare at low water of spring tides; its eastern end lies 2 miles **N.** ½ **E.** from Gurnet Lighthouse and is marked by a buoy (spar, red, No. 6). The ledge extends from the buoy nearly to the shore and vessels should not attempt to pass westward of the buoy.

Gurnet Rock is a detached ledge near the end of the shoals making 600 yards eastward and southeastward from Gurnet Point; it has 4 feet over it and is marked by a buoy (spar, red, No. 2), which should be left on the starboard hand by vessels entering.

1A. ***Approaching from Southward.***—Give the shore a berth of at least 1 mile, although it may be approached closer in places. Keep Gurnet Lighthouse bearing westward of **NW.** and steer for it, and when up to the whistling buoy at the entrance proceed as directed in section 2, following:

Remarks.—**Manomet Point** is 5¼ miles **S.** by **E.** ⅝ **E.** from Gurnet Point, and **Rocky Point** is nearly 2¼ miles northwestward of Manomet Point. A little southward of Rocky Point is a high hill (Manomet Hill, see description, page 72) which will show prominently and be seen before either of the points can be distinguished.

When northward of Rocky Point the town of **Plymouth** will be seen over Long Beach and the entrance buoys near Gurnet Point should be seen.

Dangers.—**Stellwagen Rock,** a small, detached rock with 6 feet over it, lies about ¾ mile from the shore and 2 miles **S.** by **E.** ⅝ **E.** from Manomet Point.

Mary Ann Rocks are two detached rocks, bare at low water, the easternmost lying ⅞ mile **SE.** ¼ **E.** from the northeastern end of Manomet Point. The inner rock lies about 300 yards **NW.** from the easternmost.

Stone Horse Rocks are bare at low water and lie between Mary Ann Rocks and the southeastern extremity of Manomet Point.

There are **several outlying rocks** between Manomet Point and Rocky Point, but these are avoided by giving the shore a berth of at least ¼ mile, and the sailing line passes well eastward of them.

Gurnet Lighthouse and beacon in range clears the dangers in approaching from southeastward.

2. ***Entering and to an Anchorage.***—Having followed the directions in section 1 or 1 A until near the whistling buoy off the entrance, bring Duxbury Pier Lighthouse to bear **W. ¼ S.** and in range with the right-hand tall smokestack (there are two tall smokestacks on the large red-brick factory). Steer for Duxbury Pier Lighthouse on this range and pass 50 to 75 yards north of black spar buoy No. 3. When abreast of this buoy, Pierhead beacon (granite openwork pyramid with staff and cage on top) will bear **W.** by **S.**, and black spar buoy No. 5 should be seen just southward of and nearly in range with the beacon.

Steer **W.** by **S.** for Pierhead beacon and leave black spar buoy No. 5 about 50 yards on the port hand, and when this buoy is abeam change the course to **WNW. ¼ W.** so as to pass about 120 yards southward of Duxbury Pier Lighthouse. When the lighthouse is abeam haul northward gradually so as to leave Duxbury beacon at least 100 yards on the starboard hand. Anchor about 400 yards westward of the beacon in 5 to 8 fathoms water.

Destring to anchor in the Cowyard.—Leave Duxbury beacon about 150 yards on the starboard hand and steer about **N.** so as to leave red spar buoy No. 6, marking the western side of the Muscle Bank, 50 yards on the starboard hand. Then steer **NNE. ¼ E.** and anchor in the Cowyard with the south end of Clark Island bearing about *ESE.*, distant 650 yards.

Bound to Duxbury.—A pilot must be taken; it is not safe to attempt to go beyond the Cowyard without one.

Bound to Kingston Bay.—There is a channel into Kingston Bay as far as the wharf at Captain Hill. No sailing directions can be given for this channel, however. Strangers should anchor westward of Duxbury beacon and take a pilot.

Bound to Plymouth Inner Harbor.—Small vessels may round black spar buoy No. 7, on Dicks Flats, passing northward of it, and steer about **SW. ½ S.**, heading from buoy to buoy and leaving them on the side indicated by their color, and carrying not less than 12 feet water in the channel, until Pierhead beacon bears *E. ½ N.*, distant about 200 yards. Here anchor and take a pilot.

Remarks.—The range of Duxbury Pier Lighthouse and the right-hand one of the two tall smokestacks of the large red-brick factory on the west shore, leads fair into the entrance and passes well southward of Bass Rock buoy.

On the **W.** by **S.** course for Pierhead beacon care must be taken not to be set off the sailing line by the currents; at low water parts of Browns Bank will show bare, and when the shoal is covered it is often marked by rips or breakers.

On the **WNW. ¼ W.** course black spar buoy No. 7, on Dicks Flats, will be on the port bow. At half ebb there will be a current with considerable velocity setting southeastward south of Duxbury Pier Lighthouse and the beacon northwestward of it.

The **NNE. ¼ E.** course leads through the Cowyard in good water, but on both sides of the channel, which has a width of 175 yards at its narrowest part, flats rise abruptly with from 3 to 12 feet of water over them near their channel edges. At low water the edges of the shoals on both sides of the channel can be distinguished by the discolored water. The width of the channel at the anchorage is about 350 yards.

Vessels desiring a pilot are advised to get one while off the entrance, or they may anchor westward of Duxbury beacon and take one from the anchorage.

Dangers.—**Bass Rock** has 4 feet over it and lies about 500 yards **S. ¼ W.** from Gurnet Lighthouse; it is marked by a buoy (spar, red, No. 4).

Browns Bank is the extensive shoal, showing bare in places at low water, which extends eastward 2¾ miles from Pierhead and forms the southern side of the channel westward of Gurnet Point. The northern edge of this shoal rises abruptly from the deep water of the channel and is marked by several buoys. East end of Browns Bank buoy (can, black, No. 1) marks the eastern end of the shoal and lies ¾ mile **SSE. ¼ E.** from Gurnet Lighthouse. Browns Bank buoy (spar, black, No. 3) is on the edge of the shoal about ⅜ mile westward of black

buoy No. 1. West Browns Bank buoy (spar, black, No. 5) is on the edge of the shoal nearly ⅝ mile eastward of Duxbury Pier Lighthouse.

Saquish Point Shoal makes southward nearly ¼ mile from the point about 1½ miles westward of Gurnet Point. **Saquish Head Rock,** a detached rock with 6 feet of water over it, lies 350 yards southward of **Saquish Head,** the bluff, sandy head on Saquish Point. The bight between Saquish Head and Gurnet Point is full of shoals, and shoals extend from Saquish Head to Duxbury Pier Lighthouse.

Dicks Flats, showing bare at low water, lie northward of Pierhead and join the western end of Browns Bank. The channel into Plymouth Harbor leads along the western edge of these flats. A buoy (spar, black, No. 7) is placed on the northern point of the shoal.

Muscle Bank is the extensive shoal making southwestward from Clark Island, and is marked at its southern end by Duxbury Pier Lighthouse (see table, page 14). Near the western edge of the bank northwestward of the lighthouse are Duxbury beacon (square, granite structure, surmounted by a granite post) and a buoy (spar, red, No. 6).

Captain Flat is the large shoal lying on the western side of the Cowyard and extending to Duxbury Point. Along the edge of the channel the depths on the flat range from 4 to 11 feet, but the greater part of it, lying nearest the shore, is dry at low water. The southeastern point is marked by a buoy (spar, black, No. 9), which marks the western side of the entrance to the Cowyard. The channel to Captain Hill wharf is not marked.

COAST FROM PLYMOUTH TO BARNSTABLE.*

Nearly 3¼ miles **S.** from Gurnet Point is Rocky Point. Between these two points a deep indentation makes into the shore, to which is often given the name of **Plymouth Bay.** This bay is separated from Plymouth Harbor by Long Beach, which leads **S.** by **E.** ½ **E.** for 2¼ miles from Pierhead, its northern point. At its southern end the shore turns abruptly eastward for two miles to Rocky Point, thus forming a large cove—**Warren Cove;** this cove affords anchorage in southerly winds in 3 to 5 fathoms, sandy bottom.

From Rocky Point the general course of the shore is **SE.** for nearly 2½ miles to Manomet Point. The shore between these two points varies in height and character, and is backed by high, wooded hills, the most conspicuous of which is **Manomet Hill,** 390 feet high. Manomet Point is almost bare of trees and has several houses upon it.

From Manomet Point the general trend of the shore is **S.** for 4 miles to Center Hill Point. The shore between these points is wooded and of moderate height, except at **Indian Hill,** 2¼ miles below Manomet Point. This hill is high, thickly wooded, and shows precipitous faces seaward. **Center Hill Point** is a low point, cleared near its eastern extremity, but backed by wooded higher lands.

From Center Hill Point the shore has a **SW.** by **S.** direction for 1½ miles, then turns westward for ½ mile, and then sweeps with a regular curve from **SW.** to **SE.** by **S.** around to the entrance of Sandwich, 6¼ miles below. The shore is for the most part thickly wooded, and faced by a sand beach called **Scusset Beach** to abreast of West Sandwich, about 5 miles below Center Hill Point. From here to the entrance of **Sandwich Harbor** the shore is low and composed of marsh lands faced by a sand beach known by the name of **Town Beach.** Back of the beach are higher lands, partly wooded and partly cleared and settled.

The entrance to the harbor of Sandwich is extremely narrow, passing between two stone piers or breakwaters; it can only be entered at high water, and then a pilot is necessary. Pilots may always be obtained off the bar at the entrance of the harbor. The village of **Sandwich** is westward of the harbor, ½ mile back from the beach.

From Sandwich Harbor entrance **Spring Hill Beach** extends in a **SE.** ¾ **E.** direction for 2¾ miles; it is backed by low lands, cultivated and settled. Thence the trend is **ESE.** ½ **E.** for 6 miles to Barnstable entrance, and the shore is for the most part composed of sand hillocks backed by marshes. The highest part of this shore with some houses and trees upon it, and lying just eastward of Spring Hill Beach, is known as **Scorton Neck.** From here **Sandy Neck,** composed entirely of sand and dotted with occasional clumps of trees, extends to Barnstable entrance. At its eastern end it turns more southward and terminates in **Beach Point,** on which is Sandy Neck Lighthouse (see table, page 14).

The coast from Rocky Point to 1½ miles south of Center Hill Point should be given a berth of 1 mile, as there are a number of outlying rocks and ledges. When beyond this limit the shore is generally bold-to and can be approached as close as ⅝ mile until 2 miles westward of the entrance to Barnstable Harbor (see sailing directions for this harbor).

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*See footnote on page 71.

BARNSTABLE HARBOR.*

This harbor lies on the southern shore of Cape Cod Bay; the entrance, about 38 miles **SSE.** from Minots Ledge Lighthouse, is obstructed by a shifting bar with 7 feet over it at low water, and is marked by **Sandy Neck Lighthouse** (see table, page 14), which is on the western point. The harbor is formed by an arm of the bay extending in a general **E.** and **W.** direction about 3 miles between Sandy Neck and the main shore; flats and shoals occupy nearly the whole harbor, leaving only narrow channels, which are difficult for a stranger to follow. Vessels entering usually await a favorable stage of the tide to cross the bar. Few vessels enter the harbor, the greatest draft being 12 feet. Strangers should make signal and remain well outside the bar until a pilot comes out. Towboats are seldom used.

The town of **Barnstable** and village of **Yarmouth Port** are on the southern shore of the harbor, the latter being of no commercial importance. The approach to Yarmouth Port is by a narrow, shallow slue making through the flats, which are bare at low water, and lie on the eastern side of Barnstable Harbor proper.

Marine Hospital.—Emergency relief is furnished at Barnstable by the U. S. Public Health and Marine Hospital Service as for stations of Class IV (see Appendix IV).

Ice obstructs the harbor during the winter. Note the remarks on page 71.

Tides.—See table, page 11.

The **tidal currents** generally set fair with the direction of the channel.

For **variation of the compass** see page 11.

GENERAL DIRECTIONS, BARNSTABLE HARBOR.

The following directions lead to the entrance, where a pilot should be taken.

From a position ¾ mile eastward of Minots Ledge Lighthouse, steer **SSE.** about 36½ miles.

Or, from a position 1 mile westward of Race Point Lighthouse, steer **S.** by **W.** about 17½ miles.

Make the signal for a pilot and stand off and on, or anchor in about 6 fathoms water with Sandy Neck Lighthouse bearing about *SSW.* ½ *W.*

Remarks.—Sandy Neck Lighthouse should be made on the starboard bow. The entrance is full of flats and shoals which extend 2 miles from the shore eastward of the lighthouse, and vessels should not shoal the water to less than 6 fathoms. In strong northerly winds a heavy sea makes on the bar and vessels bound to Barnstable should anchor in Plymouth or Provincetown until the weather moderates.

COAST FROM BARNSTABLE TO WELLFLEET.

From the entrance to Barnstable Harbor the shore has a general direction of about **E.** ¼ **N.** for 9 miles, when it curves sharply northward and has a general direction of **N.** ½ **E.** for about 6 miles to Wellfleet Harbor. The shore is broken in a few places by small creeks, none of which are of importance; and there are several small villages a little back from the beach, plainly visible from offshore.

The coast is comparatively low, and for the most part cleared and settled, and backed by thickly wooded hills. The shore may be approached a little eastward of Barnstable entrance in 3¾ fathoms to within ¼ mile, but farther eastward the 18-foot curve is from ¼ to 1¼ miles from the shore.

WELLFLEET HARBOR.†

is situated on the western side of the hook of Cape Cod, near its southern end, and about 11 miles southward of Provincetown Harbor. Extensive shoals lie in the entrance and extend about 5½ miles westward from **Billingsgate Island Lighthouse** (see table, page 14), which marks the western side of the entrance to the harbor. **Mayo Beach Lighthouse** is at the head of the harbor and is the guide to the anchorage in the inner harbor. The channel into the harbor leads between the shoals and is comparatively narrow, but is marked by buoys so as to be easily followed in the daytime in clear weather; it has a least depth of 14 feet until above Smalley Bar.

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* Shown on charts **110**, scale $\frac{1}{80,000}$, price $0.50; **389**, scale $\frac{1}{20,000}$, price $0.20.

† Shown on charts **110**, scale $\frac{1}{80,000}$, price $0.50; **340**, scale $\frac{1}{50,000}$, price $0.20.

The town of **Wellfleet** is at the head of the harbor, but can only be reached by vessels at high water. It is of no commercial importance, but has railroad communication with Provincetown and Boston.

Strangers intending to enter Wellfleet Harbor generally take a pilot, and should always do so. It is usual to go into Provincetown Harbor first and telegraph to Wellfleet for a pilot, who then joins the vessel at Provincetown. In going directly to Wellfleet entrance, if signal is made when off Billingsgate Island, a pilot will come out from the town, the vessel anchoring meanwhile, if desirable, in the channel off the shoals.

The greatest draft of vessels entering Wellfleet Harbor is about 12 feet; the usual draft averages about 8 feet. Vessels do not enter this harbor in winter. Towboats can be had from Boston.

Anchorages.—The best anchorage is in the inner harbor, where the depth ranges from 10 to 15 feet. The anchorage in the outer harbor is somewhat exposed in westerly winds; the depth ranges from 14 to 31 feet between Billingsgate Island and Smalley Bar, and from 14 to 18 feet between Stony Bar and Billingsgate Island. In strong northerly gales vessels that have fallen to leeward of Provincetown sometimes anchor on the lee side of Billingsgate Shoal in 3 to 8 fathoms water, the shoal breaking the sea so that vessels with good ground tackle can ride out a heavy gale from northward.

There are no special harbor regulations.

Tides.—The tides are about the same as at Plymouth (see table, page 11).

The tidal currents are weak.

SAILING DIRECTIONS, WELLFLEET HARBOR.

The directions in sections 1 and 2 are good for vessels of 8 feet draft, in daylight, with a favorable wind and clear weather, and lead to an anchorage in 14 to 19 feet of water just northward of Smalley Bar buoy. Strangers of over 8 feet draft should take a pilot at Provincetown or after coming to anchor south of Billingsgate Shoal. The directions in section 1 A are for vessels of over 8 feet draft, or those that, having fallen to leeward of Provincetown, desire to anchor under the lee of Billingsgate Shoal.

1. ***Approaching and Entering.***—From a position ¾ mile west of Race Point Lighthouse steer **S.** nearly 15 miles; or, from the whistling buoy off Plymouth entrance, steer **SE.** about 21½ miles; or, from a position 1½ miles eastward of Minots Ledge Lighthouse steer **SSE.** ½ **E.** nearly 36½ miles. Billingsgate Island Lighthouse should then bear **ENE.** distant nearly 6½ miles, and the black can buoy marking the end of Billingsgate Shoal should be ½ mile distant and in line with the lighthouse. Pass ¼ mile south of this buoy and steer **E.** nearly 4¼ miles until Billingsgate Island Lighthouse bears *NNE.*, then steer **NE.** by **E.** so as to pass close southward of black spar buoy No. 3. Leave this buoy about 50 yards on the port hand and follow the directions in section 2.

Remarks.—Vessels finding themselves too far westward to see the buoy on the end of Billingsgate Shoal, should bring Billingsgate Island Lighthouse to bear **ENE.** and steer for it on this bearing until up to the buoy. On the **E.** course when Billingsgate Island Lighthouse bears **NNE.** Bibb Rock buoy should be nearly 1¼ miles distant on the starboard bow, and the course should then be changed to **NE.** by **E.** for Billingsgate Flat buoy, which should be made a little on the port bow.

Dangers.—**Billingsgate Shoal** commences about 4¼ miles northward of Billingsgate Island Lighthouse and extends 8¼ miles in a general **SW.** direction from the shore of Cape Cod and about 5¼ miles in a general **WSW.** direction from the lighthouse. It is marked at its western end by a buoy (can, black, No. 1). The water shoals gradually on the northern side of the shoal, but on its southern side the shoaling is abrupt.

Bibb Rock, a detached rock with 8 feet over it, lies 2⅜ miles **S.** ⅛ **E.** from Billingsgate Island Lighthouse; it is marked by a buoy (spar, red and black horizontal stripes).

Billingsgate Flat has 3 to 9 feet of water over it, and a part nearest the island is bare at low water; it extends about 1⅝ miles southward from Billingsgate Island; it is marked at its southeastern point by a buoy (spar, black, No. 3).

1 A. ***Approaching and to an Anchorage Southward of Billingsgate Shoal.***—Follow the directions in section 1, until Billingsgate Island Lighthouse bears *ENE.*, taking care to pass westward of Billingsgate Shoal buoy.

When ¼ mile southward of the buoy, steer **E.** by **N.**, and when the water shoals to 4 fathoms anchor with Billingsgate Island Lighthouse bearing about *NE.* ½ *E.*

At night.—To avoid the end of Billingsgate Shoal, keep Wood End Light bearing a little eastward of *N.* ⅛ *E.* until Billingsgate Island Light bears northward of **ENE.** Steer for Billingsgate Island Light when it bears **NE.** by **E.** ½ **E.**, and anchor when the water shoals to 4 fathoms with the light distant about 2¾ miles.

Remarks.—A stranger approaching Wellfleet from northward and being uncertain of his distance westward of Billingsgate Island can tell when the shoals are cleared by using the lead. The water shoals gradually on the north side of Billingsgate Shoal, and when the depth is about 4½ fathoms it is advisable to stand westward until the buoy on the end of the shoal is made. *At night* the lights on Race Point, Wood End, Long Point, Sandy Neck, and Billingsgate Island may all be seen at one time. If on a line between Sandy Neck and Billingsgate Island lights, a course for the latter passes about ⅛ mile southward of Billingsgate Shoal buoy. In approaching the light care should be taken to avoid the southern edge of the shoal, which rises abruptly from deep water.

For dangers, see section 1, preceding.

2. ***From Billingsgate Flat Buoy to the Anchorage above Smalley Bar.***—Leaving Billingsgate Flat buoy about 50 yards on the port hand, steer **N.** by **E.** about ¾ mile, then change course to about **NW.** ½ **N.**, keeping red spar buoy No. 2 a little on the starboard bow. Leave this buoy about 25 yards on the starboard hand and steer about **N.**, so as to leave red spar buoy No. 4 about 30 yards on the starboard hand. When this buoy is abeam steer about **NE.** nearly 1½ miles; leave black spar buoy No. 5 about 30 yards on the port hand and steer about **N.** by **E.** Anchor in 16 to 20 feet of water, about 400 yards northward of this buoy, and if bound to the wharves await high water and a pilot.

Remarks.—The **N.** by **E.** course from black spar buoy No. 3 will clear the eastern edge of Billingsgate Flats. When the course is changed to **NW.** ½ **N.** two red spar buoys should be on the starboard bow. The channel leads westward of these buoys and is very narrow; on the ebb tide the current has a tendency to set a vessel southeastward.

On the **NE.** course black buoy No. 1 should be made and kept a little on the port bow. After this buoy is passed a stranger should not go farther toward the head of the harbor without a pilot.

Dangers.—**Lieutenant Island Bar** extends from the eastern shore toward Billingsgate Island, leaving a channel 100 yards wide with a least depth of 14 feet between its western end and the shoals that make eastward from Billingsgate Island. The eastern edge of this channel is marked by two buoys (spars, red, Nos. 2 and 4).

Smalley Bar makes eastward from the west shore about 1⅛ miles northward of Billingsgate Island. It is marked at its eastern end by a buoy (spar, black, No. 5), eastward of which the channel is about 200 yards wide.

A large area of the **flats** which extend from the eastern shore toward the channel is uncovered at low water.

PROVINCETOWN HARBOR*

is formed by a turn in the northern end of the Hook of Cape Cod, and has a diameter of about 2 miles. Its entrance is about 11 miles above Billingsgate Island Lighthouse and lies between the western shore of the Hook and Long Point, the southeastern extremity of the point of the Hook. This harbor is one of the best on the Atlantic coast, being of sufficient capacity for large fleets and having anchorage in from 3 to 10 fathoms, with excellent holding ground. Coasters and fishermen seek shelter here from gales from any direction.

The approach and entrance are free from danger and are marked by three lighthouses: **Race Point Lighthouse,** on the northwestern point of Cape Cod; **Wood End Lighthouse,** on the southern end of the Hook, where it turns eastward; and **Long Point Lighthouse,** on the western point at the entrance to the harbor. At night Cape Cod Lighthouse will show over the land westward of it when approaching the entrance on certain bearings. (See table on page 14, for description of these lighthouses).

Herring Cove, about ¾ mile southward of Race Point Lighthouse, affords a lee from easterly winds; small vessels sometimes anchor well inshore in from 10 feet to 4 fathoms, according to draft. The **Naval Trial Course** (1 mile long) is between Race Point and Wood End lighthouses, and is marked by a black spar buoy at each end of the course; these buoys lie ¾ mile and 1 mile from the shore.

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*Shown on charts **110**, scale $\frac{1}{80,000}$, price $0.50; **341**, scale $\frac{1}{50,000}$, price $0.20.

Provincetown occupies the northwestern shore of the harbor, being situated at the base and on the slopes of the high, steep hills which form this shore. It is the home port of many vessels engaged mainly in the cod, mackerel, and whale fisheries, and to a limited extent in the coasting and foreign trade. Such portion of the carrying trade of the port as is done by strangers is confined mostly to the transportation of coal, salt, lumber, and wood.

Prominent objects.—In making the northern part of Cape Cod in clear weather, the first objects seen are the tall standpipe and several high church spires in Provincetown. It is frequently difficult to recognize natural landmarks on Cape Cod when approaching from seaward owing to a lack of distinctive features. The life-saving stations (see pages 25-26) and the lighthouses are about the only well-defined marks; of the latter, Cape Cod Lighthouse is the most important, being the chief guide for this part of the coast.

The depth of water at the entrance and in Provincetown Harbor is ample for vessels of deep draft. There are practically no dangers, if the shores be given a berth.

There are a number of wharves, but their use is confined to vessels of less than 13 feet draft. The principal ones are the steamboat wharf and the one belonging to the railroad. At mean low water the depth at the outer ends of these two is 8 feet for the former and 7 feet for the latter. The other wharves run dry or nearly dry at low water.

Pilots are not necessary and are rarely taken by strangers in entering. Extracts from the pilotage laws of the State are given in Appendix II.

Towboats are not much used. During the stormy season towboats from Boston are generally to be found here; by telegraphing one can be called from there in 6 hours.

There are no special harbor regulations. The custom-house is near the head of the steamboat wharf.

The **U. S. Marine Hospital** at Chelsea, Mass., is the one to which mariners entitled to hospital treatment are sent from Provincetown. Under the Public Health and Marine-Hospital Service and subject to its regulations (see Appendix IV), mariners entitled to treatment receive relief as provided for at stations of Class IV.

Supplies, provisions, and some ship-chandler's stores can always be obtained. Coal can not, as a rule, be had for steamers; only a limited quantity is kept on hand. Fresh water is furnished by a water boat; it can also be obtained at the railroad wharf.

Storm warning displays of the U. S. Weather Bureau are made at Provincetown from High Pole Hill or Town Hill. The signals hoist 130 feet above the sea and are visible from all directions in approaching the coast. They are also made at Race Point and Cape Cod Lighthouse. An explanation of the use and meaning of these signals is given in Appendix III, and a list of stations is given on page 24.

Communication.—Steamers run daily during the summer, and make two or three trips a week during the rest of the year, to Boston, with which place Provincetown has railroad communication.

Ice.—This harbor is closed by ice only in extremely severe winters. When the pack ice extends across Cape Cod Bay, it may be forced across the harbor entrance, and thus favor the formation of local ice inside. When the pack at the entrance is broken up, the harbor ice quickly follows it. As a rule, when ice packs across the entrance to Provincetown Harbor it requires for its removal winds from **NE.** around by northward to **NW.**, unless, as stated above, the pack extends over the whole bay and is heavy enough to resist the sea caused by such winds. In such cases the pack must first be broken up along the southern shores of the bay by southerly or southeasterly winds; and then, if these be followed by strong northerly or northeasterly winds, the harbor will soon be cleared. Winds from **S.** to **SW.** have a tendency to force the drift ice from the bay into the harbor; but these winds are of rare occurrence during the winter months.

For **tidal data**, see table, page 11.

Currents.—Off Race Point the tidal currents have considerable velocity; the flood sets southwestward and the ebb in the opposite direction. Westward of the stretch of coast forming the western side of the harbor the currents are nearly as strong; here the flood sets in a southeasterly direction, the ebb sets northwesterly. At the entrance and in the harbor the tidal currents have little velocity. With spring tides, at half flood the current has somewhat greater velocity at the entrance and then sets westward, inside Long Point, and toward the western side of the harbor.

SAILING DIRECTIONS, PROVINCETOWN HARBOR.

These directions are good for vessels of the largest size and deepest draft either in the daytime or at night. In thick weather great caution is required, as the lead can not always be depended on to give warning of too close an approach to the end of Cape Cod from westward on account of the abrupt shoaling of the water from 20 fathoms to 3 fathoms.

1. ***Approaching and Entering from Eastward, around Cape Cod.***—Passing Cape Cod Lighthouse steer northwestward, following the trend of the shore and giving it a berth of 1½ miles or more. When Race Point Lighthouse bears southward of *SW.*, steer so as to give the shore a berth of ¾ mile or more and round Race Point Lighthouse at this distance, and when it bears *ENE.* steer **SSE.** until Wood End Lighthouse is abeam. Now steer about **E.**, giving the shore eastward of the lighthouse a berth of at least ¼ mile. Follow the trend of the shore, giving it a berth of ⅝ mile while southward and southeastward of Long Point Lighthouse, and pass southward of black spar buoy No. 3 marking Long Point Bar.

Round Long Point Lighthouse, giving it a berth at least ⅝ mile, and when it bears *W.* steer about **NW.** ½ **W.**, and anchor according to draft with the lighthouse bearing eastward of *S.*; do not approach the eastern or northeastern shores of the harbor nearer than ¾ mile on account of extensive flats which make out. Toward the northern shore the shoaling is gradual; toward the western shore it is abrupt from 9 to 2 fathoms.

At night.—With Cape Cod Light bearing *W.* distant 2 miles, steer **NW.** ¼ **N.** for 6 miles. Then steer **WNW.** ½ **W.**, and when Race Point Light bears southward of *SW.* steer about **WSW.** until Race Point Light bears *S.*; then steer so as to pass ¾ mile westward of the light, when the directions above should be followed.

In thick weather.—Lay courses that will lead farther offshore than the preceding, and pay particular attention to the fog signal at Race Point. After rounding Race Point care must be taken to stand far enough southward to clear Wood End; if the fog signal at Wood End Lighthouse is not heard, and it is known that the vessel is southward of it, stand eastward, using the lead, until the vessel is in 11 fathoms. Then haul northward and northwestward, keeping in this depth, until Long Point fog signal is heard. Anchor north of this fog signal in 8 fathoms.

Or, if the wind is easterly, a good lee will be found in 6 to 10 fathoms on the western side of Cap Cod for a distance of 5 miles south of Provincetown Harbor.

Remarks.—See the remarks on currents in the general description preceding. The eastern shore of Cape Cod northward of Cape Cod Lighthouse should be given a berth of 1½ miles to avoid Peaked Hill Bar.

When Race Point Lighthouse bears southward of **SW.** the shore may be approached as close as ½ mile and in some places ¼ mile, but the former distance is the safe one. The shore between Race Point and Wood End Lighthouse should be given a berth of 1 mile to avoid Shank Painter Bar, and the black spar buoys of the Naval Trial Course. When standing in for the harbor, Cape Cod Light at night will be seen across the intervening land and will show brighter than the other lights.

Dangers.—**Peaked Hill Bar** commences about 3 miles northwestward of Cape Cod Lighthouse and extends along the shore 2¾ miles, its distance from the beach being about ¾ mile. The depth over the shoal ranges from 14 to 18 feet and in heavy weather it is marked by breakers. A whistling buoy (red, "P. H. B." in white letters) is placed about 1¼ miles from the shore and 4¾ miles **NW.** by **N.** from Cape Cod Lighthouse, as a guide to keep vessels from approaching the bar too closely in thick weather.

Shank Painter Bar makes off ⅝ mile from the shore about midway between Race Point and Wood End lighthouses. The bar rises abruptly from a depth of 20 fathoms and the depth near its edge is 11 to 15 feet. At its western edge it is marked by a buoy (spar, black, No. 1), and fish stakes usually extend out on it some distance from the shore.

Long Point Bar makes out from Long Point, its eastern end being ¼ mile **E.** by **S.** from the lighthouse, and is marked by a buoy (spar, black, No. 3). The depth on its end is 7 to 16 feet.

1 A. ***Approaching from Northward or Westward.***—Stand for either Race Point Lighthouse or for Wood End Lighthouse on any course until within about 1 mile of either, then follow the directions given in section 1, preceding.

COAST OF CAPE COD FROM RACE POINT TO MONOMOY.*

At Race Point the shore curves northward and then eastward, direction about **E.** ¼ **N.**, when it again turns and takes a course about **SE.** by **E.**, and to the Highlands the trend is about **SE.** and the total distance about 9 miles. All of the east coast from Race Point to the Highlands is composed of bare, sand hillocks of

* Shown on charts **7**, scale $\frac{1}{400,000}$; **110, 111**, scale $\frac{1}{80,000}$, price of each $0.50.

various heights. On approaching the Highlands the sand hills begin to be covered with a brownish-looking growth of grass and the land is higher. The pitch of the cape at this point shows a high, sand bluff, with steep, almost perpendicular faces, on which stands Cape Cod Lighthouse. In coasting several life-saving stations are seen, and just northward of the lighthouse is the signal station. Vessels passing this station can communicate with Boston by using the international code signals. At the Highlands the shore may be safely approached as close as ½ mile, but the water shoals somewhat abruptly and care must be taken not to go inside of 5 fathoms. About 3 miles northwestward of Cape Cod Lighthouse, and nearly ¾ mile offshore, is the eastern end of Peaked Hill Bar, described above.

From the Highlands to Nauset Beach Lighthouses, about 12 miles southward, the shore has a slight curve and a general **S.** by **E.** direction; it is steep, almost perpendicular, sand bluffs of various heights, with narrow valleys at intervals. On a bluff 3¼ miles northward of Nauset Beach Lighthouses and close to the shore are four, high, wireless-telegraph, skeleton towers, which are the most prominent marks on Cape Cod.

Nauset Beach Lighthouses will appear, when seen from northward, as three low, white towers upon the summit of a steep, sand bluff. Southward of the lighthouses the coast turns very gradually southward—direction about **S.** ¼ **W.** to Chatham, 10½ miles below. It gradually becomes lower, less steep, slopes gently back from the beach, and is covered with a scanty growth of grass. A few houses appear at long intervals. About 3¾ miles below Nauset Beach Lighthouses is the entrance to **Nauset Harbor**. Hence to Chatham the coast shows a low, sandy shore covered with small hillocks and backed by higher lands.

Chatham Bar, the northern entrance to Chatham, is about 10½ miles southward of Nauset Beach Lighthouses, and 1¼ miles northward of Chatham Lighthouses. This bar is a shifting one, and the depths over it are liable to change. It extends ¾ mile from the shore, and is marked off its eastern end by a red nun buoy, and about ¼ mile eastward of the latter is a red whistling buoy ("Chatham Bar"). This bar is dangerous in thick weather, and when in its vicinity the shore should not be approached closer than in 8 fathoms. Nauset Beach extends 4½ miles in a **SW.** by **S.** direction from Chatham Bar.

From Cape Cod Lighthouse to near Chatham entrance the coast should not be approached closer than ½ mile. Nauset Harbor entrance may be known by the thickly clustered houses in the villages, which appear on the summit of **The Ridge**, a rising ground somewhat higher than the land northward. In passing along Nauset Beach the town of **Chatham** and **Chatham Lighthouses** (see table, page 14) can be seen over it.

A short distance southwestward of the southern end of Nauset Beach, and nearly joined to it at low water, is a narrow spit called **Monomoy Island**, which extends southward 5½ miles and forms the northern side of the entrance to Nantucket Sound. It is low, barren, and sandy, covered with innumerable sand hillocks, and lies about **SSW.** and **NNE.** Its eastern shore is foul, having many sand shoals off it. Vessels sometimes anchor off this shore in from 4 to 6 fathoms and wait for a fair tide to beat through the sounds. As a general rule the shore should not be approached nearer than 1 mile for a distance of 4 miles southward of Chatham Lighthouses. The southern end of Monomoy Island is called **Monomoy Point**, and nearly 1¼ miles above its southern extremity stands **Monomoy Point Lighthouse**, which marks the northern point at the entrance to Nantucket Sound. From this lighthouse, Nantucket (Great Point) Lighthouse, bears **SSW.** ¼ **W.**, distant 10⅝ miles, and the light on Bishop and Clerks Shoal **WNW.** ¼ **W.**, distant about 11½ miles. Shoals make off nearly 5 miles in a general **ENE.** direction from the end of Monomoy Point (see sailing directions for Nantucket and Vineyard sounds).

The life-saving stations, with their location, will be found on pages 25–26.

Currents.—The currents are tidal along the eastern coast of Cape Cod, but flood and ebb are usually of unequal velocity and duration. The flood (northerly current) predominates at zero, or very low, declinations, and the ebb (southerly current) at very high declinations of the moon. The strength of the ebb current is usually reached at the southing (transit) of the moon and the strength of the flood 6 hours later.

Off Chatham Lighthouses 2 miles per hour, and off Cape Cod Lighthouse 1 mile per hour may be expected at strength.

MONOMOY AND NANTUCKET SHOALS.*

Eastward and southeastward of the eastern entrance to Nantucket Sound are numerous and extensive shoals, known as Monomoy and Nantucket shoals. Owing to the great extent and distance of some parts of these shoals from the land, and to the strong and baffling tidal currents which set over them, their navigation

* Shown on charts **7**, scale $\frac{1}{400,000}$; **51**, Mercator projection, degree of latitude=21.4 inches; **111**, scale $\frac{1}{80,000}$, price of each $0.50; and in part on charts **213**, scale $\frac{1}{80,000}$, price $0.50; **250**, scale $\frac{1}{40,000}$, price $0.20.

in thick or foggy weather is very hazardous. In clear weather the lighthouses, light-vessels, and buoys render the navigation of the two principal channels comparatively easy, but care must be taken not to be set out of the channels by the currents. The principal (**south**) channel leads through these shoals in a nearly due **E.** direction from Nantucket (Great Point) Lighthouse, and for the purpose of description will be considered as the dividing line between Nantucket and Monomoy shoals, which are briefly described under separate headings.

MONOMOY SHOALS

consist of numerous detached shoals of a shifting character with 3 to 18 feet over them, extending about 5¼ miles in an easterly and 9½ miles in a southeasterly and south-southeasterly direction from Monomoy Point. Many parts of these shoals, separated from others by narrow slues, have special names and are briefly described below.

Bearse Shoal is the western, and **Pollock Rip** the eastern, part of the shoal extending from ⅝ mile to 3¾ miles eastward of Monomoy Point Lighthouse. These shoals consist of a series of sand shoals and sand ridges, with 4 to 18 feet over them and deep water between them. The northeastern and southeastern extremities of these shoals lie 4 miles and 3¾ miles **ENE.** ⅝ **E.** and **SE.** by **E.** ⅝ **E.**, respectively, from Monomoy Point Lighthouse.

Broken Part of Pollock Rip, with depths of 15 to 18 feet over it, lies eastward of Pollock Rip, and is separated from it by Pollock Rip Slue, which has a width of about ¼ mile and a depth of 3½ to 6 fathoms.

Twelve-foot Shoal, southward of the Broken Part of Pollock Rip, has 14 to 18 feet over it and lies 5¼ miles **SE.** ¼ **E.** from Monomoy Point Lighthouse.

Broken Rip, with depths of 7 to 18 feet over it, lies just southward of Twelve-foot Shoal.

Stone Horse Shoal, Little Round Shoal, and **Great Round Shoal** are portions of a continuous series of sand shoals and sand ridges, with depths of 5 to 18 feet over them, lying directly eastward of the entrance of Nantucket Sound and between the two main channels. Stone Horse Shoal and Little Round Shoal lie on the south side of the deep-water channel between them and Pollock Rip. Great Round Shoal lies from 6 to 9½ miles in a **SSE.** direction from Monomoy Point Lighthouse; southward and eastward of this shoal for a distance of about 2¼ miles there are numerous shoal spots with depths varying from 17 to 18 feet over them.

Orion Shoal is a small, shoal spot with 17 feet over it, lying 9¾ miles **SE.** ⅝ **S.** from Monomoy Point Lighthouse and 11 miles nearly **E.** by **N.** from Nantucket (Great Point) Lighthouse. About ⅝ mile **SE.** ½ **E.** from the shoal is a red bell buoy.

An **18-foot spot** lies 2¼ miles **SE.** from Orion Shoal, and the depth between them ranges from 3½ to 8 fathoms. About ¼ mile **S.** from the 18-foot spot is a buoy (nun, red, No. 4), which is one of the buoys marking the South Channel.

Shovelful Shoal, extending ¾ mile southward from Monomoy Point, is bare in places and rises abruptly from the deep waters of Butlers Hole.

Handkerchief Shoal, southwestward of Monomoy Point, is described on page 88.

NANTUCKET SHOALS

consist of numerous sand shoals and ridges lying eastward, southeastward, and southward of the eastern end of Nantucket Island, and at distances varying from 1 to 39 miles from the shores of that island. The common features of the sand ridges are that their greatest length is generally in a northerly and southerly direction and that they rise abruptly from deep water. Many of the shoals are separated by deep-water slues, but they are too crooked and the currents too strong and variable to permit of navigation by strangers. Portions of these shoals have special names and are briefly described as follows:

McBlair Shoal, the most northern of the Nantucket Shoals, lies 9¼ to 12¼ miles **E.** ¼ **S.** from Nantucket Lighthouse, and consists of numerous sand spots with depths over them ranging from 15 to 22 feet. Near the northeastern extremity of the shoal is black can buoy No. 5, and near its northwestern extremity is black can buoy No. 7, both on the southern side of the channel leading between Monomoy and Nantucket Shoals.

Rose and Crown, a number of detached shoals with depths of 4 to 18 feet over them, lie about 10 miles eastward of Sankaty Head Lighthouse. They form a part of the shoals which extend in a broken line for a distance of over 15 miles south from McBlair Shoal, and are not more than 2 miles wide in an easterly and westerly direction. **Great Rip** is a part of these shoals, and lies southward of Rose and Crown; it has depths of 12 to 18 feet over it.

Bass Rip, lying about 2½ miles eastward of the southeastern end of Nantucket Island, has 3 to 18 feet of water over it, is nearly 4 miles long in a **N.** by **E.** and **S.** by **W.** direction, and not over ¼ mile wide at any part.

Old Man Shoal consists of a long, narrow shoal, with several spots off its southwestern end, extending from a point about 1 mile off the southeastern end of Nantucket Island, in a general southwesterly direction for about 5 miles. The depths on this shoal range from 7 to 18 feet.

Old South Shoal is a number of shoal spots with 7 to 18 feet over them, extending nearly 4 miles in a general **NE.** and **SW.** direction, about 12 miles southeastward from Nantucket Island; its shoalest part lies 13½ miles **S.** by **E.** from Sankaty Head Lighthouse.

Davis South Shoal is 3 miles long **E.** and **W.**, and about 1 mile wide, with depths of less than 5 fathoms, and has a number of spots with 15 to 18 feet over them; the middle of the shoal lies 20 miles **S.** ½ **E.** from Sankaty Head Lighthouse. Depths of 5¾ to 7 fathoms extend 8 miles southwestward of this shoal, and 24 miles about **S.** by **E.** ½ **E.** from the shoal is Nantucket Shoals Light-vessel (see table, page 16).

Davis Bank, lying 18 miles in a general southeasterly direction from Nantucket Island, is about 15 miles long in a **N.** and **S.** direction, and has a general depth of about 5 fathoms; it lies 3 to 4 miles eastward of Rose and Crown and Great Rip, with 10 to 18 fathoms between. Near its northern end, 15½ miles **E.** ⅛ **S.** from Sankaty Head Lighthouse, there is a spot with only 16 feet of water over it. For a distance of 3 miles northward of this spot are places with 4 fathoms.

Fishing Rip is a narrow bank with depths over it ranging from 4 to 10 fathoms, the ruling depth being about 6 fathoms; the depth around it ranges from 16 to 21 fathoms. Its southern end lies 29½ miles **SE.** ½ **S.** from Sankaty Head Lighthouse, and the bank extends about 6 miles in a **NNE.** direction. Detached spots with 4½ to 7 fathoms over them extend 10 miles north from the rip.

Phelps Bank is not a danger to navigation, nor can it be considered as a part of Nantucket Shoals, but soundings on it might be a warning to vessels approaching those shoals from a southeasterly direction. **Asia Rip** has a depth of 10 fathoms over it and is on the southern end of the bank in about latitude 40° 47′ N. longitude 69° 23′ W. and is about 14¼ miles **NE.** by **E.** from Nantucket Shoals Light-vessel (see table, page 16). From Asia Rip, Phelps Bank, with a depth of 15 fathoms or less, extends about 7½ miles in a general northeasterly, and 3 miles in a southwesterly, direction; it is about 2½ miles wide at its widest part.

Numerous shoal spots with 10 to 18 feet over them lie between the shoals inside of a distance of 15 miles from the shore of Nantucket Island. These are not named and too numerous for description.

Channels.—There are two principal channels leading from eastward into Nantucket Sound, known as Monomoy Passage and Main or South Channel.

Monomoy Passage is a general name for the passage through Pollock Rip Slue, Butlers Hole, and the deep water channel joining the two. **Pollock Rip Slue** leads between Pollock Rip on the west and Broken Part of Pollock Rip on the east, is about ½ mile wide, and has a depth of 3¾ to 6 fathoms. It is well marked by buoys, and its entrance is 4 miles **ENE.** ½ **E.** from Monomoy Point Lighthouse and is marked by Pollock Rip Shoals Light-vessel. The passage from the southern end of Pollock Rip Slue to the northeastern entrance to Butlers Hole has a length of about 3 miles and a width of about 1⅛ miles except at its western end, where it is ½ mile wide; the eastern end of the passage is marked by Pollock Rip Light-vessel, the western by Shovelful Shoal Light-vessel. **Butlers Hole,** the passage between Shovelful Shoal and Stone Horse Shoal, is ½ to 1 mile wide and extends about 2 miles in a **SW.** direction from the light-vessel; its general depth varies from 8 to 28 fathoms. In clear weather when the aids can be seen 3¾ fathoms can be carried into Nantucket Sound through Monomoy Passage. There is a narrow passage with a least depth of 3¼ fathoms leading between the southern part of Broken Part of Pollock Rip and Twelve-foot Shoal, and although buoyed it is not much used.

South or Main Channel leads into Nantucket Sound between Monomoy and Nantucket Shoals. A number of buoys and Great Round Shoal Light-vessel indicate the best water of this channel; the entrance is marked by a whistling buoy which lies 15½ miles **E.** ½ **S.** from Nantucket Lighthouse, and 9¾ miles **E.** from Great Round Shoal Light-vessel. By this channel a least depth of 5 fathoms can be carried into Nantucket Sound.

Tidal Currents.—Northward of Pollock Rip the general set of the flood is eastward of **NE.** and of the ebb a little westward of **SW.** Southward of McBlair Shoal the flood sets northward of **NE.** and the ebb southward of **SW.** The current sets in all directions of the compass during the twelve lunar hours, without ever being at rest; turning from **N.** to **E.** and **S.** to **W.** (with the hands of a watch,. About 4 miles is the greatest velocity observed; this was on the rips eastward of Nantucket Island. About 3 hours after the currents turn they acquire their greatest velocity.

NANTUCKET AND VINEYARD SOUNDS*

lie between the south coast of Cape Cod and the Elizabeth Islands on the north, and Nantucket Island and Marthas Vineyard on the south; their combined length from Monomoy Point to Cuttyhunk is about 43 miles. At the eastern entrance of Nantucket Sound are the Monomoy and Nantucket shoals, and in the sounds are numerous shoals, but well-marked channels lead between them, making the navigation of these waters, in

*Shown on charts **111, 112,** scale $\frac{1}{80,000}$, price of each $0.50. See also footnote on page 81.

clear weather and with a fair wind, comparatively easy westward of Monomoy Shoals. The most important of the shoals are described in connection with the sailing directions through the sounds or for the harbors. The sounds are a thorofare for coasting vessels bound to ports east of Cape Cod and returning bound southward, many thousands of vessels passing through both ways each year. The depth of water in the channel westward of Cross Rip is sufficient for the largest vessels, but at Cross Rip and eastward of it a draft of 27 feet requires very careful piloting to prevent grounding at low water. This route is more direct, for vessels bound along the coast, than outside of Nantucket Shoals. Pilots or towboats, and sometimes both, are often employed by large, square-rigged vessels bound along the coast through the sounds in ballast.

NANTUCKET SOUND

is the body of water lying between the south shore of Cape Cod and Nantucket Island. Its eastern entrance is between Monomoy Point and Great Point, and it extends westward about 26½ miles, joining Vineyard Sound northward of West Chop. Between Monomoy Point and Great Point it is 9¼ miles wide, but a little farther westward it is 20 miles wide; at Cape Poge it is 8 miles and northward of West Chop about 3½ miles wide.

The north shore of Nantucket Sound, between Chatham and Succonnesset Point, is generally low and sandy, backed by low, wooded hills; it is well settled and the church spires some distance back from the beach form conspicuous landmarks when standing along the shore. The principal towns and villages west of Chatham and near the coast are: Harwichport, Dennisport, West Dennis, West Yarmouth, Hyannisport, Centerville, Osterville, Cotuit, and Falmouth. These have small vessels engaged in fishing and but little commerce, except Hyannis, which employs a number of vessels in carrying coal and general merchandise. Shoals extend out in some cases for a distance of 2 miles from the shore. Surrounding Bishop and Clerks Lighthouse are a number of shoal spots with 13 to 18 feet over them with channels between through which 3¼ to 7 fathoms can be taken, but a vessel of over 14 feet draft should not attempt to pass northward of Bishop and Clerks Lighthouse unless well acquainted with the locality.

Nantucket Island, forming the southern shore of Nantucket Sound, is of irregular shape, lies nearly **E.** and **W.**, and is about 15 miles long. It is widest at its eastern end, where, from Great Point to the southeastern point of the island, the distance is about 9½ miles; but it gradually diminishes in width from this westward until it terminates in a narrow strip of sand abreast of Tuckernuck Island. **Great Point**, marked by **Nantuckt Lighthouses**, (see table, page 16) is the northern point of a long, narrow, sand beach lying north of the main body of the island, and is separated from the latter by Nantucket Harbor. The surface of the island is hilly (none of the hills being over 100 feet in height, however) and partly wooded, with steep sand bluffs on its northern and eastern sides. The highest part of the island is near the eastern end. About 5 miles **S.** by **E.** ¼ **E.** from Nantucket Lighthouse is **Squam Head**, a bluff about 40 feet rising nearly vertically from the water's edge; on the bluff is a large house with a cupola. About 2¼ miles **S.** by **E.** ¾ **E.** from the cupola is a steep hill 90 feet high, on which is **Sankaty Head Lighthouse** (see table, page 16). On the northern side of the island, the land is generally low, sandy, and for the most part bare of trees. Vessels coming in through Butlers Hole see nothing of Nantucket Island but Great Point and Sankaty Head, the latter only in very clear weather; those coming in by the main channel will on clear days see Sankaty Head, the House on Squam Head, Great Point, the life-saving station southward of Nantucket Lighthouse, and broken, abrupt bluffs of moderate height.

Westward of Nantucket Island, and separated from each other only by sand bars, are **Tuckernuck, Gravel,** and **Muskeget islands.**

Nantucket Island is almost surrounded by shoals; those which lie eastward and southeastward of it (described on pages 82–83) make it one of the most dreaded parts of the coast. The shoals in the sound are sufficiently described in connection with the sailing directions.

The only harbor on the shore of Nantucket Island is Nantucket Harbor (see heading).

Channels.—The shoals extending 4 miles southwestward from Monomoy Point and the shoal making off 3 miles northeastward from Great Point contract the entrance of Nantucket Sound to a width of 5¼ miles. Extending across the sound westward of Nantucket Island is an irregular line of shoals, between which are two well-marked channels with good water.

The *North Channel* leads near Bishop and Clerks Lighthouse and follows the south shore of Cape Cod northward of the principal shoals in the sound. It is mostly used in northerly winds and in winter, when the prevailing northerly winds keep the south shore of Cape Cod free from drift ice. The least depth in this channel, near Bishop and Clerks Lighthouse, is about 16 feet.

The *Main Channel* leads through an opening in the shoals near the middle of the sound and is marked by Cross Rip Light-vessel. With care a least depth of 5 fathoms can be carried from Handkerchief Light-vessel through this channel.

Just westward of Monomoy Point is a **narrow, buoyed channel** with a depth of about 18 feet; it leads northward between Shovelful and Handkerchief shoals and is an approach to Chatham Roads and to the North Channel through the sound. This channel should not be used by a stranger.

Between Muskeget Island and Chappaquiddick Island there is an opening nearly 6 miles wide, known as *Muskeget Channel.* It is full of shifting shoals, the best water being close eastward of Wasque Shoal, and a little eastward of the eastern shore of Chappaquiddick Island. This channel is partly buoyed, but should never be attempted by strangers, as the currents are very strong and variable in direction and make the navigation of it extremely dangerous. **Wasque Shoal** lies southward of **Wasque Point** (the southeastern point of Chappaquiddick Island) and rises abruptly on its southern and eastern sides from a depth of 3 and 8 fathoms to 2 and 4 feet. On its eastern edge is a small, sand island, called **Skiffs Island,** which almost disappears at times.

Near the western end of the sound are three shoals extending in a general **WNW.** and **ESE.** direction, between which are four good channels which unite at the entrance to Vineyard Sound and may be used by vessels passing through.

VINEYARD SOUND

joins Nantucket Sound northward of West Chop and extends southwestward between the south shore of Cape Cod and the Elizabeth Islands on the north and Marthas Vineyard on the south, its western limit being a line from Gay Head to Cuttyhunk. The sound is about 17 miles long and the width varies from 7 miles to a little less than 3 miles abreast Nobska Point Lighthouse, its narrowest part.

Marthas Vineyard is a large, irregular-shaped island about 15 miles long **E.** and **W.** and 8 miles wide at its widest part. It is well settled, especially along its northern shore, and has submarine cable connection with the mainland at Woods Hole. The principal towns are Edgartown, Vineyard Haven, and Cottage City, the last being an important summer resort. **Cape Poge,** generally spoken of as the northeastern point of Marthas Vineyard, is really the northern point of **Chappaquiddick Island,** which is separated from Marthas Vineyard by Edgartown Harbor and **Katama Bay,** and the narrow slue connecting them. The opening from the sea into Katama Bay has sometimes been closed, but now there is a shallow opening through which fishing boats pass in smooth water at high tide. **Lake Anthony,** which is at Cottage City, and has a depth of 4 to 9 feet, now has an entrance about midway between the two large landing piers on the east side of East Chop. Two jetties with a channel 5 feet deep leading between them connect with the lake which affords an anchorage for small vessels. **East Chop** and **West Chop,** at the entrance to Vineyard Haven, are the two northernmost points on the island, and each is marked by a lighthouse. **Gay Head,** the northwestern point of the island, and one of the most remarkable headlands along the Atlantic coast, is marked by a lighthouse, and is a prominent landmark for entering Vineyard Sound from westward. Seen from this direction the light-colored bare bluff shows clearly between the darker land on either side. There is a telegraph cable across Vineyard Sound from near the western end of Pasque Island to Gay Head; and a telephone cable across the sound from Nobska Point to a point about ⅝ mile northeastward of Norton Point.

About 5 miles **S.** from Gay Head is **No Mans Land,** a high, rocky, barren island, which is a prominent landmark from seaward. A couple of buoyed ledges lie between No Mans Land and the southwestern end of Marthas Vineyard. The south shore of Marthas Vineyard is unimportant and seldom approached by vessels, as it is out of the track of navigation.

The **Elizabeth Islands** extend in a general **WSW. ½ W.** direction nearly 15 miles from Woods Hole, the southwestern end of Cape Cod. They are known separately as **Nonamesset, Uncatena, Naushon, Pasque, Nashawena,** and **Cuttyhunk** islands, and separate Vineyard Sound from Buzzards Bay. The southern shores of these islands are comparatively bold-to, and in Naushon, the largest, is **Tarpaulin Cove,** a small anchorage used in northerly winds and as an anchorage for the night. Near the western end of Cuttyhunk Island is a lighthouse which serves as a guide for the entrances to Buzzards Bay and Vineyard Sound. The channels leading between the islands are treated separately.

Channels.—Westward of West Chop the channel follows the shores of the Elizabeth Islands; shoals lie off the shore of Marthas Vineyard westward of West Chop. There are three passages from Vineyard Sound into Buzzards Bay between the Elizabeth Islands; these are known as Woods Hole, Robinsons Hole, and Quicks Hole.

GENERAL INFORMATION.

Anchorages in Nantucket and Vineyard sounds.—Vessels working through the sounds against a head wind usually anchor during the night, or if becalmed and drifting toward the shoals, it is best to anchor and wait for a favorable tide or change of wind. There are no anchorages for vessels of over 10 feet draft that afford shelter from all winds, except the inner harbor of Edgartown and Woods Hole. Vineyard Haven, the anchorage

most used by coasters, is exposed to northeasterly winds. *In northerly winds* the best anchorages are off Dennisport, Hyannisport, along the north shore, and in Tarpaulin Cove. The anchorage off Falmouth is used in all winds by large vessels with good ground tackle. *In easterly winds* vessels sometimes anchor in smooth water westward of Handkerchief Shoal or inside Great Point; good shelter is then also found in Chatham Roads and Edgartown outer harbor. *In southerly winds* Edgartown Harbor and Vineyard Haven are the best anchorages; **Menemsha Bight** affords shelter and is sometimes used by vessels in the western end of Vineyard Sound. *In westerly winds* Edgartown, Vineyard Haven, and Tarpaulin Cove are good anchorages. These harbors can be entered by a stranger assisted by the chart or following the directions under the different headings. Nantucket Harbor can only be entered by light-draft vessels with comparatively smooth water.

Lights and other aids.—At night, in clear weather, no difficulty should be experienced in entering and passing through the sounds. The lights are numerous and readily distinguished (see table, pages 14–18). The buoyage accords with the system adopted for United States waters, and the aids are colored and numbered for passing through the sounds from eastward (see page 5).

Pilots and pilotage.—Pilotage is not compulsory for vessels passing through the sounds; it is only compulsory for certain vessels entering or clearing from the ports (see laws relating to "Pilots and Pilotage" in Appendix II). Pilots for the sounds or Monomoy and Nantucket shoals can be found at Provincetown or Boston by vessels coming from northward, or at Tarpaulin Cove, or Vineyard Haven, coming from westward.

Towboats.—Vessels towing usually take a towboat from the port of their departure. A powerful tug may generally be found at Woods Hole or Vineyard Haven during the winter to assist vessels that may be aground or in trouble.

Repairs.—There is a marine railway at Vineyard Haven capable of hauling out vessels of about 200 tons. The nearest place at which light repairs to the machinery of steamers can be made is at New Bedford.

Supplies.—Coal, in limited quantity, can be obtained at Nantucket, Hyannis, Edgartown, and Vineyard Haven. Provisions and some ship-chandler's stores can be had at these places.

Storm warning displays.—A list of the display stations of the U. S. Weather Bureau from which storm warning displays are made is given on page 24.

Fogs are liable to occur at any time, but are more frequent from April to October than during the remainder of the year. They come more frequently with easterly and southerly winds; northerly winds clear them away.

Ice.—In mild winters ice interferes but little with the movements of vessels in Nantucket and Vineyard sounds. In severe winters drift ice accumulates and renders the movements of sailing vessels extremely hazardous, and sometimes almost completely obstructs their progress for periods of as much as six weeks. During northerly winds, which prevail in winter, the passage along the north shore through Nantucket Sound will be clear when other parts of the sound are unsafe. Steamers force their way through the ice. Sailing vessels, if caught in a floe while entering by Monomoy Passage, are almost certain to be carried on the shoals.

It should be borne in mind that the buoys and even light-vessels are liable to be moved out of their positions by drift ice.

GENERAL REMARKS ON ENTERING AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS.

The numerous shoals, strong tidal currents, at certain seasons thick fog, and the large number of sailing vessels which are often encountered beating through the narrower parts of the channels, call for more than the ordinary attention of the navigator. In clear weather, in the daytime or in the night, the aids are readily distinguished and sufficiently numerous to enable a stranger to follow the channel without difficulty.

In clear weather sailing vessels with a favorable current, and with some local knowledge, beat through the sounds against a head wind, and when they find they are losing ground, come to anchor on either side of the sailing line or under the lee of one of the shoals or in one of the harbors, until the wind or current changes. The strongest currents will be encountered in Pollock Rip Slue, between Pollock Rip and Handkerchief light-vessels, off East and West Chop and in Vineyard Sound (see the current diagram in Appendix I); in some places the current sets directly on the shoals and in a calm sailing vessels are sometimes obliged to anchor to prevent getting aground. Most of the shoals rise abruptly from deep water, and the soundings are very irregular in depth and can not everywhere be depended on alone for warning of too close an approach to danger.

In thick weather or fog when the aids can not be seen, sailing vessels and steamers in the vicinity of Pollock Rip Slue desiring to anchor are cautioned against anchoring in the channel or near the buoys or light-vessel. The large number of steamers and tows passing through the slue in thick weather, depending entirely on the sound signals of the aids (making it necessary for them to pass close to the latter), increases the probability of collision for vessels at anchor close to them, and as there is seldom a necessity for such action, sailing vessels should avoid doing so; there is no excuse for a steamer anchoring near the aids.

Vessels when in the vicinity of Pollock Rip Shoals Light-vessel, or when between the light-vessel and the bell buoy on the Broken Part of Pollock Rip, and desiring to anchor (wind and sea permitting), should first be sure of their position, and then stand westward and anchor about 1¼ miles westward of Pollock Rip Shoals Light-vessel in 5 to 6 fathoms water.

A vessel in the vicinity of Pollock Rip Light-vessel should anchor about ¾ mile southward or southwestward from the light-vessel in 4½ to 6 fathoms water. The tidal currents here have considerable velocity and the bottom is generally sand or gravel.

When in the vicinity of Shovelful Shoal Light-vessel, steer **SE.** for 1½ miles from the light-vessel and anchor in 3½ to 4½ fathoms and about ¾ mile southward of the sailing line. The water is too deep and currents are strong in Butlers Hole, and a vessel should not anchor here except in case of necessity.

Vessels when between Butlers Hole and Handkerchief Light-vessel, or when in the vicinity of the latter, can anchor anywhere southwestward of Stone Horse Shoal in 4¼ to 6½ fathoms, taking care to be 1 to 1¼ miles southward of the sailing line. Or, they may anchor northwestward of Handkerchief Light-vessel and on the west side of the shoal.

See also anchorages, pages 85–86.

The South or Main Channel is used mostly by the very deep draft vessels passing through the sounds, and sometimes by sailing vessels that are headed by the wind so as to prevent their working through the Monomoy Passage. In thick weather a vessel may anchor (wind and sea permitting) anywhere in this channel and wait for clear weather; the bottom is generally sand, gravel, pebbles, or a combination of these. The tidal currents are not as strong as in Pollock Rip Slue or Butlers Hole, nor is the danger from collision as great as in the former. The sound signals are not as numerous as in the Monomoy Passage.

Note.—Easterly winds make high tides and strong westerly currents. Westerly winds make low tides and strong easterly currents.

SAILING DIRECTIONS, NANTUCKET AND VINEYARD SOUNDS FROM EASTWARD.

Directions for passing through the sounds from westward are given on pages 91–93, and for passing through the sounds along the north shore by the North Channel from eastward on pages 93–95. Monomoy and Nantucket shoals are described on pages 81–83, and the channels through them on page 84. The directions in section 1 are good for a draft of 18 feet, and in section 1 A for a draft of 25 feet at low water.

1. ***Entering Nantucket Sound, through Pollock Rip Slue and Butlers Hole to Cross Rip Light-vessel.***—Give the eastern shore of Cape Cod a berth of about 2 miles, and when Cape Cod Lighthouse bears *W.* steer **S.** by **E.** This course made good for about 13 miles should lead about 2 miles eastward of Nauset Beach Lighthouses, and to a position with the lighthouses bearing *NW.* by *W.*, distant about 2½ miles. Then make good a **S.** by **W.** course for 14 miles, which should lead ¼ mile eastward of the whistling buoy off Chatham Bar, and close to Pollock Rip Shoals Light-vessel.

Leaving this light-vessel close-to on either hand, steer **S.** by **W.** ¾ **W.**, heading for Pollock Rip Light-vessel. Pass nearly ½ mile westward of the whistling buoy northeastward of Pollock Rip Slue, and leave a black bell buoy 200 to 300 yards on the port hand, and a red gas-lighted buoy and red nun buoy on the starboard hand.

Pass Pollock Rip Light-vessel on either hand and with it over the stern steer **WNW.** ¼ **W.** for Shovelful Shoal Light-vessel. Pass close to Shovelful Shoal Light-vessel, haul sharply southward, and with it over the stern steer **SW.** by **W.** ⅛ **W.** for Handkerchief Light-vessel. Pass southward of this light-vessel and with it over the stern, bearing *E.* ½ *N.*, steer **W.** ½ **S.** nearly 8 miles; red nun buoy No. 12 should then bear *N.* and be distant ½ mile. Then steer **WNW.** ¾ **W.** so as to pass about 300 yards north of Cross Rip Light-vessel, and when it is abeam follow the directions in section 2, following.

Bound through the sounds along the north shore.—When up to Handkerchief Light-vessel, follow the sailing directions in sections 1 and 2, pages 93–95.

At night.—Standing southward along the coast of Cape Cod, when Pollock Rip Shoals Light-vessel is sighted steer for it on any bearing between **S.** by **W.** and **W.** Pass 300 yards westward of the light-vessel and steer about **S.** by **W.** ¾ **W.** for Pollock Rip Light-vessel and follow the directions preceding as in the daytime.

The **tidal currents** have considerable velocity from the bell buoy in Pollock Rip Slue to about midway between Shovelful and Handkerchief light-vessels (see also Appendix I and pages 83 and 86).

Remarks.—The east shore of Cape Cod is described on pages 80–81.

The **S.** by **W.** course will lead about ¼ mile eastward of the whistling buoy off Chatham Bar, and about 2½ miles eastward of Chatham Lighthouses. Pollock Rip Shoals Light-vessel should be sighted before the vessel is abreast of the whistling buoy off Chatham Bar.

On the **S.** by **W.** ¾ **W.** course Pollock Rip Light-vessel will be directly ahead, and the bell buoy at the entrance to the slue will be on the port bow and should be left on the port hand. The gas-lighted buoy ⅝ mile **N.** of Pollock Rip Light-vessel will be a little on the starboard bow.

On the **WNW.** ¼ **W.** course Shovelful Shoal Light-vessel should be right ahead, and Monomoy Point Lighthouse on the starboard bow, with the low, sand beach of Monomoy Point showing southward of the lighthouse. When westward of Pollock Rip Light-vessel two red nun buoys and a skeleton iron beacon should be left well on the starboard hand. Nantucket Lighthouse should be seen southwestward.

When standing **SW.** by **W.** ⅛ **W.** for Handkerchief Light-vessel, several red buoys near the entrance to the passage between Shovelful and Handkerchief shoals will be left well on the starboard hand.

On the **W.** ½ **S.** course Cross Rip Light-vessel will be well on the starboard bow; the course leads to a position ½ mile southward of the buoy (nun, red, No. 12) on the southeastern end of Horseshoe Shoal.

Dangers.—There are no dangers near the sailing lines until near the bell buoy, in Pollock Rip Slue. This slue leads between Pollock Rip and Broken Part of Pollock Rip (see descriptions on page 82). The shoaler water is generally marked by rips or breakers.

For descriptions of **Bearse** and **Shovelful** shoals, northward of the sailing lines, and **Stone Horse Shoal** and **Little Round Shoal**, southward of the sailing lines, see Monomoy Shoals, page 82.

A shoal with a least depth of 12 feet lies 700 yards **S.** by **W.** from Shovelful Shoal Light-vessel; its northern end is marked by a buoy (can, black, No. 5A).

Handkerchief Shoal is the extensive shoal, with from 3 to 18 feet over it, lying southwestward of Monomoy Point. It is about 4¼ miles long **N.** and **S.**, and its greatest width is about 2 miles. Its southern end, which rises abruptly from a depth of 8 fathoms to 10 feet, is about ½ mile northward of Handkerchief Shoal Light-vessel and 5¼ miles **SW.** ¾ **W.** from Monomoy Point Lighthouse, and is marked by a buoy (nun, red, No. 10). Its northern end, rising gradually from 3½ fathoms to 15 feet, lies about 3 miles **WNW.** ½ **W.** from Monomoy Point Lighthouse, and is marked by a buoy (spar, black, No. 3). On the eastern edge of the shoal are three buoys, which mark the edge of the narrow channel between it and Shovelful Shoal and Monomoy Point.

1A. ***Entering Nantucket Sound through the South or Main Channel.—I. Passing close to Great Round Shoal whistling buoy.***—When 2 miles eastward of Cape Cod Lighthouse steer **S.** by **E.** about 13 miles and pass 2 miles eastward of Nauset Beach Lighthouses. When the lighthouses bear *NW.* by *W.*, distant 2½ miles steer, **S.** ⅝ **E.** This course made good about 26 miles should lead to the whistling buoy at the entrance to the South Channel.

From this buoy make good a **W.** course, leaving red nun buoys (Nos. 2, 4, 6, and 8) on the starboard hand and black can buoys (Nos. 1, 3, 5, and 7) on the port hand. The channel between these red and black buoys is about 1 mile wide and the least depth found in it

is on two spots with 5¾ and 6¼ fathoms. Great Round Shoal Light-vessel (see table, page 16) should be made right ahead and Nantucket Lighthouse a very little on the starboard bow; by keeping a little northward of the range of the two all danger from McBlair Shoal is avoided.

Pass close northward of Great Round Shoal Light-vessel, bring it to bear *SE.* ½ *S.* and steer **NW.** ½ **N.**, keeping it on that bearing astern and Handkerchief Light-vessel ahead; when up to the black and white perpendicularly-striped can buoy, and Nantucket Lighthouse bears *SW.* by *W.* ¾ *W.*, leave the buoy on the port hand and then make good a **WNW.** ½ **W.** course. Cross Rip Light-vessel should be made a little on the port bow and kept bearing so as to pass 500 yards northward of it; then proceed as directed in section 2, following.

The above directions can be easily followed by day or by night in clear weather. If the whistling buoy is not made at night, bring Great Round Shoal Light-vessel to bear **W.** when it is distant about 9 miles and steer for it, keeping the bearing.

To pass through the sounds along the north shore.—Continue the **NW.** ½ **N.** course from Great Round Shoal Light-vessel until nearly up to Handkerchief Light-vessel, then follow the directions in sections 1 and 2 of the sailing directions for that passage, pages 93–95.

The tidal currents at times have considerable velocity, and care should be taken to make the courses good (see pages 83 and 87).

Remarks and dangers.—The **S.** ⅝ **E.** course leads 5¾ miles eastward of Chatham Lighthouses, about 4½ miles eastward of Pollock Rip Shoals Light-vessel, and 5½ miles eastward of Broken Part of Pollock Rip. If the whistling buoy is not made a vessel should manage to pick up some of the channel buoys lying 1¼ to 3 miles farther westward.

The **W.** course leads about ¾ mile northward of McBlair Shoal (see page 82), which is often marked by tide rips. As Great Round Shoal Light-vessel is approached the cupola on Squam Head and Nantucket Lighthouse should be seen, but very little of the shore will be visible. The buoys seen on both sides of the sailing line should be given a good berth.

The **NW.** ½ **N.** course leads directly for the can buoy (black and white perpendicular stripes) which lies 4⅝ miles **NE.** by **E.** ¾ **E.** from Nantucket Lighthouse.

On the **WNW.** ½ **W.** course for Cross Rip Light-vessel, Nantucket Lighthouse will be left about 3 miles on the port hand and Handkerchief Light-vessel about 2¾ miles on the starboard hand. When within 2½ miles of Cross Rip Light-vessel, Horseshoe Shoal (SE.) buoy (nun, red, No. 12) should be about ⅝ mile distant on the starboard beam.

General descriptions of Nantucket and Monomoy shoals are given on pages 82–83, and a detailed description would be of no particular value; the directions above lead well clear of all of them.

II. Passing close eastward of Orion Shoal bell buoy.—From a position with Nauset Beach Lighthouses bearing *NW.* by *W.*, distant 2½ miles, make good a **S.** ¼ **W.** course for 23½ miles and pass close eastward of the red bell buoy off Orion Shoal. Then steer **SW.** ¼ **W.** heading for Sankaty Head Lighthouse and pass ¼ mile or more eastward of red nun buoy No. 6. When Great Round Shoal Light-vessel bears **W.** steer for it on the bearing and leave it close-to on the port hand. Then follow the directions under paragraph I, preceding.

At night when there is a chance of not sighting the bell buoy keep well eastward and bring Sankaty Head Lighthouse to bear **SW.** ⅝ **W.** and steer for it on this bearing, keeping a sharp lookout so as not to run over the bell buoy. Continue the course until Great Round Shoal Light-vessel bears **W.** and then follow the directions in the preceding paragraph.

See tidal currents, pages 83 and 87.

Remarks and dangers.—The **S.** ¼ **W.** course leads nearly 2½ miles eastward of Pollock Rip Shoals Light-vessel, and if made good the bell buoy off Orion Shoal should be made a little on the starboard bow. **Orion Shoal** (17 feet of water) is about ⅝ mile **NW.** by **W.** from the bell buoy.

On the **SW.** ⅝ **W.** course Sankaty Head Lighthouse will be seen on a clear day or at night, and Great Round Shoal Light-vessel will be broad off the starboard bow. There is a 27-foot spot lying nearly 1 mile **ESE.** from Orion Shoal bell buoy, and a 29-foot spot lies ⅝ mile **E.** ½ **N.** from the buoy. Passing ¼ mile eastward of the buoy leads in the best water.

See also the remarks and dangers preceding.

2. ***From Cross Rip Light-vessel to abreast Nobska Point Lighthouse.***—Having followed the directions in section 1 or 1 A, preceding, pass 300 to 500 yards northward of Cross Rip Light-vessel; then bring it to bear *ESE.* ¼ *E.* and steer **WNW.** ¼ **W.** keeping it on the bearing astern until Squash Meadow east end buoy (can, black, No. 19) is ¾ mile distant on the port beam and Nobska Point Lighthouse bears **NW.** by **W.** (If this lighthouse is brought on this bearing when Cape Poge Lighthouse bears *S.* by *E.*, it insures clearing Hedge Fence and Squash Meadow.)

With Nobska Point Lighthouse bearing **NW.** by **W.** steer for it, keeping it on that bearing until West Chop Lighthouse bears abeam distant a little over 1 mile. Then steer **W.** by **N.** until Nobska Point Lighthouse bears *N.* by *E.* distant a little over 1 mile, when proceed as directed in section 3, following.

At night.—The above directions can be as easily followed at night as in daytime. On the **WNW.** ¼ **W.** course West Chop Light will be directly ahead, and Nobska Point Light will be nearly on the *NW.* by *W.* bearing when Edgartown Light is on the port beam. Do not enter the red rays of West Chop or Nobska Point lights; the **NW.** by **W.** course leads in the white rays of Nobska Point and West Chop lights.

For tidal currents see Appendix I.

Remarks.—The **WNW.** ¼ **W.** course leads about 1¼ miles northward of Norton Shoal, about 1 mile southward of Horseshoe Shoal, and nearly 2¾ miles northward of Cape Poge Lighthouse. West Chop Lighthouse will be made directly ahead, East Chop Lighthouse will be a very little on the port bow, and Nobska Point Lighthouse on the starboard bow.

The **NW.** by **W.** course leads about ¾ mile northward of Squash Meadow, 1 mile northward of East Chop and West Chop lighthouses, and about ⅝ mile southward of Hedge Fence, which has 3 to 13 feet over it.

Dangers.—**Horseshoe Shoal** is the name of the extensive shoals lying in the west central part of Nantucket Sound. It extends about 8½ miles in a general **NW.** and **SE.** direction, but there are narrow slues with depths of 3 to 8 fathoms crossing it, thus cutting it into a number of shoal patches. The depth on the shoals is very irregular, but many of the shoalest parts have only 2 to 9 feet, and near its northwestern extremity it rises abruptly from a depth of 12 fathoms to ½ foot. At this extremity it is marked by a black spar buoy (No. 9), which lies 2⅝ miles **E.** ½ **S.** from Succonnesset Shoal Light-vessel. From the buoy an arm of the shoal extends eastward 4 miles; on its northern side it rises very abruptly from 5 and 11 fathoms to 8 and 16 feet, and is marked by a buoy (spar, black No. 7), which lies 2⅞ miles **WSW.** from Bishop and Clerks Lighthouse. The southeastern end of Horseshoe Shoal is marked by a red nun buoy (No. 12), lying 2⅝ miles **E.** from Cross Rip Light-vessel.

There are several spots with 14 to 18 feet of water over them lying just southward of Cross Rip Light-vessel.

Norton Shoal and **Hawes Shoal** extend from a point 1¼ miles eastward of Cape Poge to a point 5¾ miles **E.** ¾ **S.** from Cape Poge. Norton Shoal has 8 to 17 feet over it and is marked by two black buoys (spar, No. 11A, and can, No. 11) near its northern edge. Hawes Shoal is triangular in shape and is lumpy and very irregular in depth (4 to 16 feet). It is marked at its northwest end by a buoy (spar, black, No. 13) and at its southwest extremity by a buoy (spar, red, No. 4).

Cape Poge Flats make off ¾ to 1¼ miles eastward, northeastward, and northward from Cape Poge. Nearly 1½ miles **NE.** from Cape Poge Lighthouse a black buoy (spar, No. 15) is placed to guide clear of the flats.

Squash Meadow, with its northwestern end lying 1¾ miles **ESE.** from East Chop Lighthouse, extends a little over 1 mile in a **SE.** direction, is less than ¼ mile in width, has 5 to 13 feet of water over it, and is marked by two black can buoys, No. 19 at its southeastern extremity and No. 21 at its northwestern extremity.

Hedge Fence is the shoal lying on the north side of the channel nearly 2 miles northeastward of East Chop Lighthouse. This shoal is 3¼ miles long in a **NW.** by **W.** ¼ **W.** and **SE.** by **E.** ¼ **E.** direction, is only about 300 yards wide, has 3 to 13 feet over it, and has 5 to 8 fathoms all around it. It is marked by two buoys (both red and black in horizontal stripes), one off its northwest end is a nun and one off its southeast end is a spar. Between it and L'Hommedieu Shoal there is a passage with a depth of 3¼ to 11 fathoms and a least width of 1 mile.

3. ***From Nobska Point Lighthouse through Vineyard Sound.***—Pass about 1 mile *S.* of Nobska Point Lighthouse and make good a **WSW.** ¼ **W.** course for 11¾ miles until Gay Head Lighthouse is abeam bearing *S.* by *E.* ¾ *E.;* then steer about **W.** for Vineyard Sound Light-vessel. Leave this light-vessel on either hand and with it over the stern, then:

Bound into Buzzards Bay.—Steer **N.** for Hen and Chickens Light-vessel and follow the directions for entering Buzzards Bay from westward.

Bound into Sakonnet River. —Steer **NW.** by **W.** ⅛ **W.** and be guided by the directions for that river.

Bound into Narragansett Bay.—Steer **WNW.** for Brenton Reef Light-vessel and follow the directions for entering Narragansett Bay from eastward.

Bound to Fishers Island Sound.—Steer **W.** ½ **N.** for 21½ miles until up to the whistling buoy off Point Judith.

Bound through Block Island Sound to Long Island Sound.—Steer **W.**, which leads about midway between Point Judith and Block Island.

Bound to Sea.—The **WSW.** ¼ **W.** course through Vineyard Sound continued for 31½ miles after passing Gay Head Lighthouse will lead to a position 3¾ miles *SE.* of Block Island (SE.) Lighthouse.

For tidal currents see Appendix I.

Remarks.—The **WSW.** ¼ **W.** course leads along the southern shores of the Elizabeth Islands. Tarpaulin Cove Lighthouse will be seen on the starboard bow, and when past this lighthouse the course leads within ⅜-mile of the shore of Naushon Island; the shore is bold-to, and a depth of 5 to 9 fathoms will be found 300 yards from it until abreast Robinsons Hole. When nearing the western end of Naushon Island, Robinsons Hole, a narrow passage leading between Naushon and Pasque islands into Buzzards Bay, and then the broader passage of Quicks Hole between Pasque and Nashawena islands, will be opened out. The black bell buoy at the southwestern side of the entrance to Quicks Hole will be left ¾ mile on the starboard hand. Gay Head Lighthouse will be seen on the port bow, and when abreast of Quicks Hole, in clear weather, Vineyard Sound Light-vessel may be seen on the starboard bow.

To avoid Lucas Shoal, keep in the northern half of the sound. At night, keep well northward of a line joining Nobska Point and Gay Head lights while between Tarpaulin Cove and Robinsons Hole.

Dangers.—**Middle Ground** is the name of a narrow shoal extending from a point nearly ¼ mile **NW.** from West Chop in a due **W.** direction for a distance of 3 miles. It has a uniform width of about 200 yards and depths for the greater part from 2 to 6 feet, increasing at its western end to 9 and 17 feet. The depths surrounding the shoal are from 6 to 11 fathoms. A buoy (can, red and black horizontal stripes) lying ¼ mile **NW.** from West Chop Lighthouse marks the eastern end of the shoal.

Several **small, shoal spots,** with 14 to 17 feet over them, lie in a **W.** by **S.** direction, and distant 1 to 2 miles from the western end of the Middle Ground. A buoy (can, red and black horizontal stripes) lying 2¼ miles **SE.** by **E.** ⅝ **E.** from Tarpaulin Cove Lighthouse marks the westernmost of these spots.

Lucas Shoal is a narrow shoal with 14 to 16 feet of water over it, lying about 2½ miles southward of Tarpaulin Cove Lighthouse and nearly in the middle of the sound. The shoal is about ⅞ mile long in a general **ENE.** and **WSW.** direction, and is marked at its western end by a buoy (can, red and black, horizontal stripes), which lies 2½ miles **S.** ¼ **W.** from Tarpaulin Cove Lighthouse. Nearly ⅞ mile **SW.** by **W.** from this buoy are two detached spots with 16 and 18 feet over them.

About 1 mile south of Pasque Island and midway between Robinsons Hole and Quicks Hole is a **spot** with 27 feet over it; this should be avoided by very deep draft vessels.

Devils Bridge is a rocky ledge making out ¾ mile in a **NW.** direction from Gay Head; it has 2 feet over it about ⅜ mile offshore and 17 feet at its outer edge. A buoy (can, black, No. 27) lies northwestward of the ledge and nearly 1¼ miles **NW.** ¾ **N.** from Gay Head Lighthouse.

Sow and Pigs Reef is a rocky ledge extending 1⅝ miles in a **WSW.** direction from Cuttyhunk. It is in part dry or awash at low water and has an average width of about 400 yards; at its outer end it has a depth of 15 feet, and is marked by a buoy (nun, red, No. 2) 1⅝ miles **SW.** by **W.** ¾ **W.** from Cuttyhunk Lighthouse.

SAILING DIRECTIONS, NANTUCKET AND VINEYARD SOUNDS FROM WESTWARD.

The directions in sections 1, 2, and 3A are good for a draft of 25 feet, and in section 3 for a draft of 18 feet; strangers of deeper draft should take a pilot.

1. ***From Vineyard Sound Light-vessel to Nobska Point.***—Leave the light-vessel close-to on either hand and steer **E.** until Gay Head Lighthouse bears *S.* by *E.* ¾ *E.* Then steer **ENE.** ¼ **E.** for 11¾ miles until Nobska Point Lighthouse bears *N.*, distant 1 mile; then follow the directions in section 2.

Or, pass 1½ miles westward and northward of Gay Head, and when the lighthouse bears *S.* by *E.* ¾ *E.*, distant 1½ miles, steer **NE.** by **E.** until Tarpaulin Cove Lighthouse bears on

the port beam, distant 1 mile. Then steer **ENE.** ¼ **E.** until Nobska Point Lighthouse bears *N.*, distant 1 mile, and follow the directions in section 2.

Remarks and dangers.—The **E.** course should lead over ⅜ mile southward of Sow and Pigs Reef, which is partly bare at low water and extends 1⅝ miles **WSW.** from Cuttyhunk.

On the **ENE.** ¼ **E.** course the bell buoy off Quicks Hole will be left ⅜ mile on the port hand, and after passing the entrance to Robinsons Hole, Lucas Shoal buoy (can, red and black horizontal stripes) should be left nearly 1½ miles on the starboard hand. Shortly after passing Tarpaulin Cove, Middle Ground West End buoy (can, red and black horizontal stripes) should be left nearly 1 mile on the starboard hand. When Nobska Point Lighthouse bears **N.** the bell buoy should be ¼ mile distant and nearly in line with the lighthouse.

When rounding Gay Head, care must be taken to give it a berth of over 1 mile to clear Devils Bridge, which makes off about **NW.** from the head.

2. ***From Nobska Point to Cross Rip Light-vessel.***—When Nobska Point Lighthouse bears *N.* distant 1 mile, steer **E.** by **S.** until Nobska Point Lighthouse bears *NW.* by *W.* Then steer **SE.** by **E.**, keeping Nobska Point Lighthouse on the bearing astern, and continue this course until the black can buoy on the eastern end of Squash Meadow bears *S.* by *W.* ½ *W.* and West Chop Lighthouse bears *WNW.* ¼ *W.*

Then steer **ESE.** ¼ **E.**, keeping West Chop Lighthouse on the bearing astern; Cross Rip Light-vessel should be made ahead on this course, and as it is approached should be left 350 yards on the starboard hand. Then, if bound through Monomoy Passage, follow the directions in section 3; if bound through the South Channel (between Great Round Shoal and Point Rip) follow the directions in section 3 A.

Remarks and dangers.—The **SE.** by **E.** course leads about 1 mile northward of West Chop and East Chop lighthouses and in mid-channel between Hedge Fence and Squash Meadow. The two black can buoys marking the ends of Squash Meadow can be easily recognized in clear weather.

On the **ESE.** ¼ **E.** course the depth on the sailing line should not be less than 8½ fathoms, and Cape Poge Lighthouse should be about 2½ miles distant when on the starboard beam. The nearest shoals to the sailing line on either side, westward of Cross Rip Light vessel, are distant nearly 1 mile.

3. ***From Cross Rip Light-vessel to Pollock Rip Shoals Light-vessel.***—When Cross Rip Light-vessel bears *S.* distant 350 yards, steer **ESE.** ¾ **E.** about 2½ miles, so as to pass ⅜ mile south of red nun buoy No. 12, and when this buoy bears *N.* steer **E.** ¼ **N.** until abreast of Handkerchief Light-vessel, which should be left on the port hand.

Then bring Handkerchief Light-vessel to bear *SW.* by *W.* ⅛ *W.* over the stern and steer **NE.** by **E.** ⅛ **E.**, heading for Shovelful Shoal Light-vessel. Leave the latter 100 yards on the port hand and steer **ESE.** ¼ **E.**, heading for Pollock Rip Light-vessel. Pass 100 yards southward of this light-vessel and then steer **N.** by **E.** ¾ **E.**, heading for Pollock Rip Shoals Light-vessel; on this course leave the bell buoy (black), on the north end of the Broken Part of Pollock Rip, about 150 yards on the starboard hand. When up to the light-vessel, which can be left on either hand, the vessel will be well clear of the shoals and a course may be set to stand along the eastern shore of Cape Cod.

Remarks and dangers.—The **ESE.** ¾ **E.** course leads south of the eastern end of Horseshoe Shoal, and red nun buoy (No. 12) should be made off the port bow. After this buoy is passed and when on the **E.** ¼ **N.** course there are no shoals until up to Handkerchief Light-vessel.

On the **NE.** by **E.** ⅛ **E.** course care must be taken not to be set northward of the sailing line by the westerly current. Shovelful Shoal Light-vessel will be made ahead and should be steered for on this course. Strong rips are seen on Shovelful Shoal, a part of which shows bare at extreme low water. A black can buoy (No. 5A) lies about ¼ mile south of Shovelful Shoal Light-vessel and marks the north end of Stone Horse Shoal.

On the **ESE.** ¼ **E.** course Pollock Rip Light-vessel will be ahead, and as it is approached the remains of an iron frame beacon and two red nun buoys will be left well on the port hand. Strong tide rips usually mark Pollock Rip and Bearses Shoal.

On the **N.** by **E.** ¾ **E.** course a red gas-lighted buoy will be left well on the port hand, and a black bell buoy will be seen a little on the starboard bow. After passing the latter, a red whistling buoy will be seen on the starboard bow and should be left nearly ¼ mile on the starboard hand.

3 A. *From Cross Rip Light-vessel to Sea, through the South or Main Channel.*—Passing 350 yards north of Cross Rip Light-vessel steer **ESE. ½ E.** about 14¾ miles until close to Point Rip Mid-channel buoy (can, black and white perpendicular stripes), and passing over ¾ mile northward of the two black spar buoys off Point Rip.

From the mid-channel buoy steer **SE. ½ S.**, heading for Great Round Shoal Light-vessel. Leave the light-vessel 200 yards on the starboard hand, and bring it to bear *W.* and steer **E.**, keeping the light-vessel on the bearing astern.

Continue the **E.** course about 9½ miles until close to Great Round Shoal whistling buoy. When close to the latter a **N. ⅝ W.** course will lead to a position 2 miles eastward of Nauset Beach Lighthouses.

Remarks and dangers.—The **ESE. ½ E.** course leads well northward of Point Rip, which extends 3¼ miles **ENE. ¼ E.** from Great Point. Nantucket Lighthouse should be distant 3 miles when it bears abeam, and before the vessel is up to the mid-channel buoy Great Round Shoal Light-vessel will be sighted well on the starboard bow.

On the **SE. ½ S.** course a black can buoy will be seen about ¼ mile southward, and a red nun buoy about ¾ mile northeastward, of the light-vessel.

On the **E.** course four black can buoys will be left well on the starboard hand, and three red nun buoys on the port hand; the sailing line leads about midway between the red and black buoys.

To pass close eastward of Orion Shoal, bound northward.—Follow the directions in section 3 A, preceding, and when Great Round Shoal Light-vessel is 200 yards distant on the starboard beam, steer **E.** for 3½ miles. Then steer **NE. ¼ E.**, leaving red nun buoy No. 6 about ¼ mile on the port hand and heading so as to pass 250 yards eastward of Orion Shoal bell buoy.

From this buoy a **N. ¼ E.** course should lead 2¼ miles eastward of Pollock Rip Shoals Light-vessel and along the eastern shore of Cape Cod at a distance of about 2 miles until abreast Nauset Beach Lighthouses.

Remarks.—See the remarks and dangers preceding.

On the **NE. ¼ E.** course Sankaty Head Lighthouse should be astern.

On the **N. ¼ E.** course care must be taken not to be set westward by the west current.

SAILING DIRECTIONS, NANTUCKET AND VINEYARD SOUNDS ALONG THE NORTH SHORE, FROM EASTWARD.

1. *From Handkerchief Light-vessel to Succonnesset Shoal Light-vessel, Passing N. of Bishop and Clerks Lighthouse.*—This passage is not safe at low water for vessels drawing over 14 feet, as there are shoal spots near Bishop and Clerks with 15 to 17 feet over them; strangers should not attempt it at night.

Passing southward of Handkerchief Light-vessel and the red nun buoy (No. 10) on the south end of the shoal, bring Handkerchief Light-vessel astern bearing *SE. ¼ S.* and steer **NW. ¼ N.** Pass about ½ mile northeastward of Bishop and Clerks Lighthouse, and to a position about 300 yards southward of Hallets Rock buoy (spar, red and black horizontal stripes). Then steer **W. ½ S.**, and continue on this course until the east end of the breakwater in Hyannis Harbor is in range with Hyannis Lighthouse, bearing about *NNE.* Then steer **WSW. ¼ W.** for 4 miles, and when Succonnesset Shoal Light-vessel bears **W. ½ S.** steer for it, keeping it on that bearing. Pass the light-vessel close-to on either hand and then proceed as directed in section 2.

To pass south of Bishop and Clerks Lighthouse, proceed as directed in section 1 A, following.

Remarks.—On the **NW. ¼ N.** course Bishop and Clerks Lighthouse will be a little on the port bow, and the course leads near the eastern end of the shoal, with 15 to 18 feet of water over it, making out eastward from the lighthouse. When the lighthouse is abaft the port beam, Hallets Rock buoy should be made a little on the starboard bow.

On the **W. ½ S.** course from Hallets Rock buoy, the bell buoy off Hyannis entrance will be left about ⅛ mile on the starboard hand, and Hyannis Harbor is left on the starboard hand.

The **W. ¼ S.** course heading for Succonnesset Shoal Light-vessel leads a little over ⅝ mile northward of the buoy (spar, black, No. 9) at the northwest end of Horseshoe Shoal, and fair between the buoy (spar, red, No. 16) southward of Wreck Shoal and the buoy (spar, black, No. 11) on the northern end of Eldridge Shoal.

Dangers.—Bishop and Clerks is the extensive shoal lying off the northern shore about 2 miles southward of Point Gammon. The shoal is marked by Bishop and Clerks Lighthouse, which stands near its center. On an arm of the shoal extending nearly ⅞ mile southward from the lighthouse and marked at its end by a buoy (spar, red, No. 12), there are several rocks awash at low water; but that part of the shoal eastward, northward, and northwestward of the lighthouse has from 13 to 18 feet of water over it.

Hallets Rock, marked by a buoy (spar, red and black horizontal stripes), is a small spot with 12 feet over it, lying 1⅛ miles **N.** by **W.** ½ **W.** from Bishop and Clerks Lighthouse.

Senator Shoal, marked at its southern edge by a buoy (spar, red, No. 8), is the southern part of the shoal which extends over 1 mile southward and eastward from Point Gammon. Near the edge of this shoal and a little northwestward of the buoy there is only 11 feet of water.

Middle Ground, with 14 to 17 feet over it, lies **W.** by **N.** from Bishop and Clerks Lighthouse. A 12-foot spot on this shoal is marked by a buoy (spar, red and black horizontal stripes) which lies 1¾ miles **W.** by **N.** from the lighthouse and west of the shoal spot.

Along the north shore, between Point Gammon and Succonnesset Point there are a number of shoals, but the sailing line leads well southward of them.

Horseshoe Shoal is described on page 90.

Wreck Shoal has 8 to 15 feet of water over it with 3¼ to 5 fathoms around it, is ¼ to ⅝ mile wide, and 1¼ miles long in an **E.** and **W.** direction. Its western end is only ⅝ mile **NE.** ¼ **E.** from Succonnesset Shoal Light-vessel. A buoy (spar, red, No. 16) is on the southern edge of the shoal.

Eldridge Shoal, lying ¾ mile **S.** of Wreck Shoal, has 3 to 18 feet over it, is less than ¼ mile wide, and is about ¾ mile long in a **NE.** by **E.** and **SW.** by **W.** direction. On its northern side is a buoy (spar, black, No. 11). The sailing line leads about midway between Wreck Shoal and Eldridge Shoal. Between the latter shoal and the western edge of Horseshoe Shoal there is a passage over 1 mile wide.

1 A. ***From Handkerchief Light-vessel to Succonnesset Shoal Light-vessel, Passing S. of Bishop and Clerks.***—Bring Handkerchief Light-vessel to bear *SE.* ⅞ *E.* and steer **NW.** ⅞ **W.** This course made good for 11¾ miles will lead about 1½ miles southwestward of Bishop and Clerks Lighthouse and to a point 2½ miles *W.* ½ *S.* from it. Succonnesset Shoal Light-vessel should then bear **W.** ½ **S.**; steer for Succonnesset Light-vessel on that bearing, keeping the lighthouse bearing *E.* ½ *N.*, and when up to the light-vessel pass it close-to on either hand, and proceed as directed in section 2, following.

Remarks.—On the **NW.** ⅞ **W.** course Bishop and Clerks Lighthouse will be on the starboard bow, and will be left about 1½ miles on the starboard hand. Bishop and Clerks buoy (spar, red, No. 12) should be left nearly 1 mile on the starboard hand, and Broken Ground Shoal (spar, black, No. 7) about ¾ mile on the port hand. The least depth on the course should not be less than 17 feet. At night the red sector of Bishop and Clerks Light should be entered when Bass River Light bears **NE.** ¾ **N.**

The **W.** ½ **S.** course leads over ⅝ mile northward of the northern edge of Horseshoe Shoal. This shoal will be cleared if a vessel keeps on the line joining Bishop and Clerks Lighthouse and Succonnesset Shoal Light-vessel. West Chop Light open a little southward of Succonnesset Shoal Light-vessel will insure clearing Wreck Shoal.

Dangers.—Bishop and Clerks is described above.

Broken Ground, with 17 to 18 feet of water over it, lies **SW.** from Bishop and Clerks Lighthouse, and extends in spots to the northeastern end of Horseshoe Shoal. The northern side near a depth of 16 feet is marked by a buoy (spar, black, No. 7).

Horseshoe Shoal is described on page 90; **Wreck Shoal** and **Eldridge Shoal** are described above.

2. ***From Succonnesset Shoal Light-vessel to Gay Head Lighthouse.***—Having followed the directions in section 1 or 1 A, bring Succonnesset Shoal Light-vessel directly astern, bearing *E.* ¾ *S.*, and steer **W.** ¾ **N.**, leaving 400 yards on the port hand the buoy (spar, red and black horizontal stripes) marking a 9-foot spot lying 1⅜ miles *W.* ¼ *S.* from the light-vessel, and passing ⅜ mile northward of the western end of L'Hommedieu Shoal. When Nobska Point Lighthouse is distant nearly 3¾ miles and Davis Neck Shoal buoy (spar, red, No. 20) is nearly ¼ mile distant on the starboard beam, steer about **W.** by **S.** so as to pass northward of black can buoy No. 19, about ½ mile southward of the lighthouse, and

close to the red bell buoy off Nobska Point. From this buoy steer **WSW.**, giving the shore of Naushon Island a berth of over ⅜ mile, and when Gay Head Lighthouse bears about *S.* by *E.* ¾ *E.*, proceed as directed in section 3, page 90.

Remarks.—On the **W.** ¾ **N.** course Nobska Point Lighthouse will be on the port bow and Falmouth Heights on the starboard bow. The latter shows a steep, sand bluff the top of which is covered with houses; red spar buoy No. 26 should be made on the starboard bow. The northern shore should be given a berth of ¼ mile, as shoals make out from it in places to nearly that distance.

On the **W.** by **S.** course several black buoys will be left on the port hand when abreast of Falmouth Heights, the westernmost buoy (can, black, No. 19) should be left 300 yards or more on the port hand. Nobska bell buoy should be made ahead and be left on the starboard hand.

See also the remarks and dangers on page 91.

Dangers.—**Succonnesset Shoal** makes out southward and eastward from Succonnesset Point in an **E.** by **S.** direction a distance of over 2 miles. It is about 2 miles long in an **E.** and **W.** direction, has an average width of about ¼ mile, and the depth over the greater part of it is from 3 to 5 feet. It is marked at its southeastern extremity by a buoy (spar, red, No. 18) which is about ⅜ mile **N.** by **E.** from Succonnesset Shoal Light-vessel. Between the light-vessel and buoy, and about 400 yards **S.** of the buoy, is a spot with 17 feet over it. A channel 500 yards wide with a depth of 5 fathoms leads between Succonnesset Shoal and Wreck Shoal.

Just southward of the sailing line is a 17-foot spot ¾ mile **W.** ¼ **N.** from Succonnesset Shoal Light-vessel.

Smalls Shoal, the 9-foot spot mentioned in the sailing directions, lies 1⅝ miles **W.** ¼ **S.** from Succonnesset Shoal Light-vessel, and is marked on its northern side by a buoy (spar, red, and black horizontal stripes).

A **16-foot spot** lies 1⅝ miles **W.** by **S.** from Succonnesset Shoal Light-vessel, and about midway between the red and black horizontally striped buoy marking Smalls Shoal and the black spar buoy marking the eastern end of L'Hommedieu Shoal.

L'Hommedieu Shoal extends from a point 2 miles **WSW.** from Succonnesset Shoal Light-vessel in a **WNW.** ¾ **W.** direction for a distance of 4½ miles. It has a general width of about ½ mile and depths from 3 to 13 feet. A buoy (spar, black, No. 13) marks its eastern end, and a buoy (spar, black, No. 15) marks the shoal near its western end. The latter buoy is 2½ miles **NE.** ¾ **N.** from West Chop Lighthouse.

Several **narrow, shoal spots** lie from 2⅛ to 2⅞ miles **E.** ¾ **S.** from Nobska Point Lighthouse; they have depths of 11 to 18 feet, and their northern sides are marked at the eastern and western ends, respectively, by buoys (spar, black, No. 17, and can, black, No. 19).

Shoals make out about ⅝ mile from the northern shore from Succonnesset Point to westward of Falmouth Heights, and in some places 6 to 9 feet will be found ⅝ mile offshore. Just eastward of Falmouth Heights is Davis Neck Shoal with 14 feet near its outer edge. A buoy (spar, red, No. 20) lying 1⅛ miles **SE.** from the precipitous face at Falmouth Heights marks the shoal.

CHATHAM ROADS AND STAGE HARBOR.*

Chatham Roads is at the northeast end of Nantucket Sound, between the extensive shoals which extend northwestward from the northern end of Monomoy Island and the shoals extending 1⅝ miles from the south shore of Cape Cod at **Harwichport,** 3 miles westward of Stage Harbor Lighthouse. It is a good anchorage in 3½ to 5½ fathoms water, and good holding ground, but is insecure for small craft in heavy southwesterly gales. The approach to Chatham Roads from southward is westward of Handkerchief Shoal. There is a narrow, crooked channel, with strong tidal currents, between Handkerchief and Shovelful Shoals; this channel is buoyed, but it should not be attempted by a stranger.

Stage Harbor is a small, well-sheltered anchorage used by fishermen and small local craft. It is entered from Chatham Roads through a narrow, crooked channel which has a depth of 4 feet at low water and is marked by a number of buoys, but a stranger should not attempt to enter without a pilot on account of the snarp turns in the channel. The town of **Chatham,** on the northeastern side of the harbor, has no commerce except some vessels engaged in the fisheries, and occasionally a cargo of coal is brought in small coasting vessels. There is an approach by water from the eastern side of Cape Cod, but the channel depth is uncertain and the approach is now from Stage Harbor (see Chatham Bar, page 81).

Stage Harbor and Chatham lighthouses (see table, pages 14–16) are the guides for entering Chatham Roads and to the entrance of the buoyed channel into Stage Harbor. The western edge of **Common Flat,** the shoal on the eastern side of the roads, is marked by buoys.

Storm warning displays of the U. S. Weather Bureau are made near Chatham Lighthouses and near Monomoy Point Lighthouse.

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*Shown on chart **111**, scale $\frac{1}{80,000}$, price $0.50.

Marine Hospital.—Emergency relief is furnished at Chatham by the U. S. Public Health and Marine-Hospital Service as for stations of Class IV (see Appendix IV).

Tides.—See table, page 11.

SAILING DIRECTIONS TO THE ANCHORAGE IN CHATHAM ROADS.

The directions in sections 1 and 1A are good for a draft of 18 feet. In heavy southwesterly gales the anchorage is insecure for small craft. Vessels of 7 feet draft can be taken into Stage Harbor at high water, but it requires local knowledge. No stranger should attempt to pass between Shovelful and Handkerchief shoals, as the channel is very narrow and the tidal currents strong; the buoys are the only aids.

1. ***Approaching and Entering from Southward or Southwestward.—I. From Handkerchief Light-vessel.***—Having followed the directions in section 1 or 1 A, (pages 87–89), pass south of Handkerchief Light-vessel and bring it to bear *E.*, distant about ½ mile; then steer **N.** about 2½ miles or until Monomoy Point Lighthouse bears *E.* by *N.* Then steer **NNE.** ½ **E.** about 6½ miles until Stage Harbor Lighthouse is in range with Chatham Lighthouses, bearing **ENE.** ⅝ **E.**

Steer for Stage Harbor Lighthouse, keeping it in range with Chatham Lighthouses, pass northward of red nun buoy No. 4, and when nearly up to Mid-channel buoy (spar, black and white perpendicular stripes) haul northward and anchor northward of the buoy in about 4¾ fathoms, soft bottom.

II. From Cross Rip Light-vessel.—When close to the light-vessel steer **E.** by **S.** about 2¾ miles, and when red nun buoy No. 12 is well abaft the port beam steer **NE.** ⅜ **E.** about 14 miles until Stage Harbor Lighthouse and Chatham Lighthouses are in range; then follow the directions in the preceding paragraph.

Remarks.—On the **N.** course the western edge of Handkerchief Shoal should be left ½ mile on the starboard hand. The shoal rises abruptly on this side and care should be taken not to be set eastward on to it.

On the **NNE.** ½ **E.** course the black spar buoy marking the northwest end of Handkerchief Shoal should be left nearly ¾ mile on the starboard hand; the houses of South Harwich will be made a little on the starboard bow and Harwichport (with prominent, tall, white church spire) on the port bow. Stage Harbor Lighthouse should be made broad off the starboard bow and on the high land eastward of it the Chatham Lighthouses will be seen.

As soon as Stage Harbor Lighthouse and Chatham Lighthouses are in range they should be steered for; this will lead clear of all shoals and into Chatham Roads. Southward and southwestward of Stage Harbor Lighthouse are several buoys marking the narrow channel from the Roads into Stage Harbor.

Dangers.—**The western edge of Handkerchief Shoal** extends 4¼ miles in a general **N.** by **E.** ¾ **E.** direction from the light-vessel. This edge of the shoal has from 6 to 16 feet of water over it and is marked at its southern end, just north of the light-vessel, by a buoy (nun, red, No. 10). The northwestern end of the shoal is marked by a buoy (spar, black, No. 3).

Rodgers Shoal has 13 to 18 feet of water over it, is about 1 mile long in a **NW.** and **SE.** direction, and is ¼ mile wide. It lies north of Handkerchief Shoal, and is marked at each end by a buoy (spar, red and black horizontal stripes). The channel between Handkerchief Shoal and Rodgers Shoal is about ⅜ mile wide and has a least depth of 3½ fathoms, and the channel between Rodgers Shoal and the shoal making westward from the southern end of Monomoy Island is ⅜ mile wide and has a depth of 4 fathoms.

Shoals make out a distance of 1 to 2¾ miles from the western shore of Monomoy Island, extending northward to Stage Harbor Lighthouse.

Common Flats, the shoal lying westward and northward of the north end of Monomoy Island, has a ruling depth of 1 to 4 feet, and rises abruptly on its northern and western edges from 4 fathoms to 5 and 8 feet, but is well marked by buoys.

Harwich Flats is an extensive shoal, with 5 to 17 feet of water over it, making off 1⅜ miles southward from the shore between South Harwich and Harwichport. It is on the northwestern side of Chatham Roads and protects the anchorage in northwesterly winds.

1 A. *Approaching and Entering, from Westward.*—Vessels of 14 feet or less draft can pass ⅝ mile north of Bishop and Clerks Lighthouse and steer **E.** for 6½ miles. Bass River Lighthouse should then bear *NW.* by *N.*, and Kill Pond Bar buoy should be ¾ mile distant on the port beam. Then steer **ENE.** ⅝ **E.**; on this course Stage Harbor Lighthouse should be made ahead and in range with Chatham Lighthouses. Then follow the range and proceed as directed in section 1, preceding.

Vessels passing south of Bishop and Clerks Lighthouse. When the lighthouse bears *N.*, distant 1¼ miles, steer **ENE.** ½ **E.** As soon as Stage Harbor and Chatham lighthouses are made they should be brought in range and steered for. Anchor as directed under section 1.

Remarks.—The **E.** and **ENE.** ½ **E.** courses lead about ¾ mile southward of the end of Kill Pond Bar and the buoy marking it. The northern shore should not be approached closer than 2¼ miles until standing on the range for entering the roads.

Dangers.—**Kill Pond Bar** has 4 to 7 feet of water over it and makes off from the shore eastward of Bass River Lighthouse; the end, marked by a buoy (spar, red, No. 6), is 3 miles **SE.** ⅜ **S.** from the lighthouse and 2 miles **S.** from the wharves at Dennisport.

Harwich Flats and **Common Flat** are described under section 1.

NANTUCKET HARBOR.*

This harbor lies on the northern shore of Nantucket Island, midway between its eastern and western ends. The entrance is between the western point of **Coatue Beach** on the **E.** and **Brant Point** on the **W.**, and is ⅜ mile wide, but the available channel is much contracted by Coatue Flats. Nantucket Harbor proper lies at the entrance to a large, shallow lagoon of very irregular shape which runs in a nearly **NE.** direction about 4¾ miles, the head of the lagoon being separated from the ocean by a strip of sand over which the sea breaks in heavy easterly gales.

Coatue Point, the eastern point at the entrance to the harbor, is a low, flat, sand point forming the western extremity of a long, sand beach, with a few trees, called **Coskata Beach** and **Coatue Beach,** which extends about 5 miles in a nearly **SW.** direction from the northeastern shore of Nantucket Island, and in no place is over ¼ mile wide. The body of water contained between this beach and the main land of Nantucket Island is known as Nantucket Harbor at its western end and Head of the Harbor at its northeastern end.

Brant Point, the western point at the entrance to the harbor, is a low, flat, sand point, extending out from the bluffs, and is easily recognized by **Brant Point Lighthouse,** which is built near its eastern end. The high perpendicular bluffs westward of it and large hotels will enable anyone to recognize the entrance to the harbor. When seen from westward these bluffs hide the town, except the tops of some of the higher steeples; but seen from northward, the thickly clustered houses will appear over the low land of Brant Point.

The town of **Nantucket** is built upon the western shore of the harbor just southward of Brant Point. The entrance to the harbor is closed to any but vessels of light draft by a shifting sand bar. The harbor is of but little commercial importance, and is rarely visited by strangers. Vessels may, however, make a good anchorage in southerly gales outside the bar in from 4 to 7 fathoms, sticky bottom; but no vessel of over 6 feet draft should attempt to enter the harbor without a pilot. In September, 1902, about 6 feet at low water could be taken in the buoyed channel across the bar. There are two stone jetties which extend northward from each point at the entrance, and are only partly visible at high water. At the end of each jetty is a pile of rocks with a lighted beacon.

Nantucket Cliff Range beacons (see page 16), two small pyramidal wooden structures, are near the foot of the bluffs and **NW.** by **W.** ½ **W.** from Brant Point Lighthouse.

Storm warning displays of the U. S. Weather Bureau are made at Great Point and Nantucket. For an explanation of the signals, see Appendix III.

Tides.—See table, page 11.

Ice.—Except in severe winters, the harbor is seldom closed by local formations of ice, but is frequently closed by drift ice from the sound, which packs and remains across the entrance during northerly winds.

*Shown on charts **111**, scale $\frac{1}{80,000}$, price $0.50; **343**, scale $\frac{1}{10,000}$, price $0.25.

GENERAL DIRECTIONS, NANTUCKET HARBOR.

The following directions are good for a draft of 5 feet with smooth water:

Approaching and Entering.—From Handkerchief Light-vessel steer **S.** by **W.** ¾ **W.**; or from Cross Rip Light-vessel steer **SE.** by **E.** ⅝ **E.** for Nantucket Lighthouse until Brant Point Lighthouse bears **S.** ¼ **E.**, when steer for it on that bearing until nearly up to the bell buoy off the entrance.

When close to the bell buoy stand into the harbor, heading from buoy to buoy, leaving the buoys on the side indicated by their color. Give Brant Point a berth of from 50 to 150 yards and anchor in 11 to 17 feet of water, sticky bottom, with Brant Point Lighthouse bearing between *NW.* and *N.* by *E.* and distant 200 to 550 yards.

Remarks.—The approach to the harbor, between Great Point and the eastern end of Tuckernuck Shoal, is about 6 miles wide and clear of dangers. Vessels should keep at least 1½ miles offshore until on the range of Nantucket Cliff beacons. The channel over the bar and into the harbor is liable to change and vessels must be guided entirely by the buoys.

Dangers.—A detailed description of the dangers would be of no value; shoals make out over 1 mile from the shore at the harbor entrance and eastward and westward of it; the edge of this shoal at the entrance to the harbor is well marked by buoys.

Tuckernuck Shoal is the shoal extending about 6¾ miles in a northeasterly direction from Muskeget Island. It has depths over it varying from 3 to 18 feet, the ruling depths being 8 to 10 feet. The northeastern extremity of the shoal is marked by a buoy (can, black, No. 7) lying about 6¾ miles **WNW.** ⅝ **W.** from Nantucket Lighthouse; this buoy is a Nantucket Sound buoy and should be left on the starboard hand by vessels approaching Nantucket entrance. A bell buoy (black and white perpendicular stripes) lies on the northern side of Tuckernuck Shoal, 3¼ miles **S.** by **E.** from Cross Rip Light-vessel, and marks a slue in the shoal through which the steamer to Nantucket passes in smooth weather.

HYANNIS HARBOR*

is a bight in the south shore of Cape Cod, about 15 miles westward of Chatham, which affords shelter from all but southerly winds. It is much used as a harbor of refuge by small coasting vessels bound through Nantucket Sound; those of 14 feet or less draft anchoring inside the breakwater, where there is a limited area protected from all winds; vessels of over 14 feet draft anchor outside. The area protected by the breakwater is about 175 acres, but much of it is very shallow, only a small part having been dredged to a depth of 15½ feet.

The entrance to the harbor lies 12 miles **NW.** from Handkerchief Light-vessel, and **NNW.** ¼ **W.** from Bishop and Clerks Lighthouse; it is somewhat obstructed by shoals, which are, however, well marked by buoys or spindles. Bishop and Clerks Light and Hyannis Light and range beacon are the principal guides for entering at night. The old tower on **Point Gammon**, the eastern point at the entrance, is a prominent mark in the daytime.

Lewis Bay is the large, shallow body of water making northeastward from Hyannis Harbor; it is only used by small local craft, the entrance being obstructed by shoals.

The town of **Hyannis** is about 1 mile inland; **Hynanis Port** is at the head of the bight which forms Hyannis Harbor; it has a little trade and is a terminus of the New York, New Haven and Hartford Railroad. The railroad wharf has a depth of 9 feet at its end at low water, and is a conspicuous mark when entering.

The entrance is approached from eastward between Bishop and Clerks Lighthouse and Point Gammon, and from westward by the main channel from Succonnesset Shoal Light-vessel. The depth in the channel up to the breakwater is 15 to 16 feet.

Pilots are not generally taken, but a vessel desiring one should make signal when off the entrance.

Supplies.—Water and a limited supply of coal may be obtained at the railroad wharf, and provisions and some ship-chandler's stores at Hyannis.

Repairs.—Vineyard Haven is the nearest place at which repairs to hulls of vessels can be made, and New Bedford, Providence, or Boston for making repairs to the machinery of steamers.

Storm warning displays of the U. S. Weather Bureau are made near Hyannis Lighthouse (see Appendix III).

Marine Hospital.—E mergency relief is furnished at Hyannis by the United States Public Health and Marine-Hospital Service as for stations of Class IV (see Appendix IV).

*Shown on chart **247**, scale $\frac{1}{20,000}$, price $0.25; and in part on charts **111**, **112**, scale $\frac{1}{80,000}$, price of each $0.50.

Ice seldom interferes with the movements of vessels, the prevailing northerly winds keeping the harbor clear (see ice, page 86).

Tidal data is given in the table on page 11.

SAILING DIRECTIONS, HYANNIS HARBOR.

The following directions are safe for vessels of 12 feet or less draft, and if closely followed are good for vessels of 14 feet draft.

1. *Approaching and Entering, from Eastward.*—Pass about ½ mile northeastward of Bishop and Clerks Lighthouse on a **NW.** ¼ **W.** course, and about 300 yards southward of the buoy on Hallets Rock. When Bishop and Clerks Lighthouse bears *SSE.* ½ *E.* steer **NNW.** ½ **W.**

When Hyannis Lighthouse and range beacon are in range, bearing about **N.** by **E.** ⅓ **E.**, steer for them and take care to leave the end of the breakwater about 100 yards on the port hand. Then haul more northward, and anchor in 15½ feet of water, soft bottom, behind the breakwater.

Remarks.—Care should be taken not to approach Bishop and Clerks Lighthouse closer than ⅝ mile while passing it, and after the light has been passed a sharp lookout should be kept for the buoy on Hallets Rock, which should be left 300 yards on the starboard hand.

On the **NNW.** ½ **W.** course a red spar buoy will be made on the starboard bow, and when it is nearly abeam Hyannis Lighthouse and the range beacon will be in range and the course should be changed for them.

Standing in for anchorage on the range, red spar buoys Nos. 2 and 4 will be left on the starboard hand, and the spindle on Great Rock, about ¼ mile on the starboard hand; the spindle on the east end of the breakwater will be on the port bow. The best anchorage for light-draft vessels is behind the breakwater in 11 to 15 feet water. Vessels of 14 feet draft should anchor about 300 yards **NE.** by **N.** from the east end of the breakwater.

Dangers.—**Bishop and Clerks, Hallets Rock, and Senator Shoal** are described on page 94.

An extensive shoal, with numerous rocks, lies on the western side of the channel leading into Hyannis Harbor, between it and the channel into Centerville Harbor. Off its eastern side this shoal is marked by a buoy (spar, black, No. 1), which is a little westward of the range of Hyannis Lighthouse and range beacon.

A red bell buoy (in summer) is placed nearly ¾ mile **SSW.** ½ **W.** from black spar buoy No. 1, and on the range of the east end of the breakwater and Hyannis Lighthouse.

Gardiners Rock, a detached rock with 8 feet of water over it, lies 1 mile **NW.** by **W.** ½ **W.** from the old light-tower on Point Gammon; off its western side it is marked by a buoy (spar, red, No. 2).

Great Rock is a bare rock on the western edge of the flats which make westward from Point Gammon; it bears about **NW.** ½ **W.**, distant 1 mile from the old light-tower on Point Gammon, and is marked by a red spindle with cage on top.

The edge of the shoal on the east side of the harbor east of the breakwater is marked by a buoy (spar, red, No. 4).

1A. *Approaching and Entering, from Westward.*—Passing close southward of Succonnesset Shoal Light-vessel steer **E.** ½ **N.** about 2¾ miles; then steer **ENE.** ¼ **E.** and pass at least ¼ mile southward of the bell buoy off Hyannis entrance. When a short distance past the bell buoy, Hyannis Lighthouse and range beacon will be in range; steer for them, course **N.** by **E.** ⅓ **E.**, and follow the directions in section 1, preceding.

Remarks.—On the **E.** ½ **N.** course Eldridge Shoal buoy (spar, black, No. 11) and Horseshoe (NW. part) buoy (spar, black, No. 9) will be left well on the starboard hand and Wreck Shoal buoy (spar, red, No. 16) on the port hand.

On the **ENE.** ¼ **E.** course Point Gammon will be on the port bow and Bishop and Clerks Lighthouse on the starboard bow. About the same time that the bell buoy is made on the port bow, the buoys marking the dangers at the entrance to Centerville Harbor may be seen well northward of the sailing line. When abreast the bell buoy, Hyannis Lighthouse will bear about **NNE.** ¼ **E.**

Dangers.—**Wreck Shoal, Eldridge Shoal, and Horseshoe Shoal** are described on pages 90 and 94.

For dangers entering the harbor see under section 1, foregoing.

CENTERVILLE HARBOR.*

This harbor is a bight in the south shore of Cape Cod, westward of Hyannis Harbor; it is about 2 miles wide, just westward of Hyannis Point. The approach to the anchorage is obstructed by rocks and shoals, through which a buoyed channel, with a depth of 10 feet at low water, leads to the anchorage, which has a depth of 15 to 21 feet and good holding ground. Vessels seldom anchor here for shelter, as the harbor is exposed to southerly winds; the shoals off the entrance somewhat break the force of the seas from southward, but not sufficiently to make it a safe anchorage. The deepest draft entering is about 12 feet.

The village of **Centerville** is some distance inland from the head of the harbor and is of little commercial importance. A church spire in the village is a prominent mark and is used as a guide for entering the harbor.

Pilots are seldom taken to enter, but may be had by making signal while off the entrance.

Ice closes the harbor in winter.

Tides.—The tides are practically the same as in Hyannis Harbor (see table, page 11).

SAILING DIRECTIONS, CENTERVILLE HARBOR.

These directions lead over a least depth of 10 feet. Strangers should not enter except in the daytime with clear weather.

1. ***Approaching and Entering, from Eastward.***—Follow the directions in section 1, page 93, until Hallets Rock buoy (spar, red and black horizontal strips) bears *N.*, distant about 300 yards; then steer **W.** ¾ **N.** about 2⅝ miles, and when Centerville Church spire bears *N.* ½ *W.* steer **N.** by **W.** ½ **W.** and anchor about ½ mile from the shore in 15 to 21 feet water, soft bottom.

Remarks.—See the remarks under section 1, page 93. On the **W.** ¾ **N.** course from Hallets Rock buoy the bell buoy off Hyannis Harbor entrance will be left about 300 yards, and Hodges Rock buoy about 400 yards, on the starboard hand. The **tall white church spire** in Centerville will be the most conspicuous landmark westward of Hyannis.

The **N.** by **W.** ½ **W.** course leads eastward of black spar buoy No. 1, and about midway between red spar buoy No. 2 and the red and black horizontally striped spar buoy on Channel Rock. Red spar buoy No. 4 is left on the starboard hand; after passing this buoy the course may be changed a little more northward, but keep westward of red spar buoy No. 6, which will be seen in the northern part of the harbor.

Dangers.—**Hodges Rock** has 6 feet of water over it and lies 2½ miles **WSW.** ¾ **W.** from the old tower on Point Gammon; it is marked off its southern side by a buoy (spar, red and black horizontal stripes).

Collier Ledge is awash at half tide and lies near the southern edge of the shoals making southward from the western side of Centerville Harbor; it is marked by a beacon (square wooden beacon with red cubical structure on top) which bears **W.** distant 4 miles from the old tower on Point Gammon.

Gallatin Rock is about 150 yards long in a general **E.** and **W.** direction and has a least depth of 4 feet over it. The rock lies nearly ¾ mile **E.** by **S.** from the beacon on Collier Ledge, and is marked off its southern side by a buoy (spar, black, No. 1).

Channel Rock is a small, detached rock with 4 feet of water over it and lies nearly ¾ mile **E.** by **N.** from the beacon on Collier Ledge; it is marked by a buoy (spar, red and black horizontal stripes).

Bearse Rock, a small, detached rock with 5 feet of water over it, lies on the eastern side of the channel about 700 yards eastward of Channel Rock; it is marked on its western side by a buoy (spar, red, No. 2).

Gannet Rocks are a detached ledge showing bare at low water and lying a little over ¾ mile **W.** by **S.** from Hyannis Point, the eastern point of the bight forming Centerville Harbor.

Gannet (Gurnet) Ledge, a detached spot with 6 feet over it, lying nearly ⅜ mile **SSW.** from Gannet Rocks, is marked off its western side by a buoy (spar, red, No. 4).

Spindle Rock, showing bare at low water, is near the upper part of the harbor, and 1 mile **S.** by **E.** from the church spire in the village. A buoy (spar, red, No. 6) is placed southward of the rock.

There are two rocks, **Middle Ledge** and **Dead Neck Rock,** with 6 feet of water over them, lying from ¾ to 1 mile about **N.** by **E.** from the beacon on Collier Ledge. These are left well on the port hand when following the sailing directions.

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*Shown on charts **112**, scale $\frac{1}{80,000}$, price $0.50; **247**, scale $\frac{1}{20,000}$, price $0.25.

1 A. *Approaching and Entering, from Westward.*—Pass close southward of Succonesset Shoal Light-vessel and steer **E.** ½ **N.** for 2¾ miles. Then steer **NE.** by **E.** for 3½ miles until the church steeple in Centerville bears **N.** ¼ **W.** Steer for the steeple on this bearing until Gallatin Rock buoy (spar, black, No. 1) is 500 yards distant on the port beam, and then steer **N.** by **W.** ½ **W.** and follow the directions in section 1, foregoing.

See the remarks and dangers under section 1 A, page 99, and section 1, preceding.

COTUIT ANCHORAGE AND COTUIT BAY.*

Cotuit Anchorage, or **Deep Hole,** is a small anchorage with 8 to 10 feet of water between the shoals making off from the shore about 6½ miles westward of Point Gammon. It is seldom used except by local craft, as it is exposed to southerly winds. The channel to the anchorage is marked by several buoys, and vessels of less than 6 feet draft should not experience any difficulty in keeping in the best water.

Cotuit Bay is a shallow body of water making in northward about 7 miles westward of Point Gammon, and northwestward of Cotuit Anchorage. It is used only by small local craft, the depth over the bar at the entrance being about 2½ feet at low water. The post village of **Cotuit** is on the western side of the bay, and the village of **Osterville** on the eastern side near its head. A stranger bound into Cotuit or Osterville bays should anchor at Cotuit Anchorage and take a pilot. Lone Rock buoy (can, red and black horizontal stripes), at the entrance to the channel, lies 7 miles **WNW.** ½ **W.** from Bishop and Clerk's Lighthouse, and **NE.** ¾ **N.** from Succonesset Shoal Light-vessel.

GENERAL DIRECTIONS, APPROACHING AND ENTERING COTUIT ANCHORAGE.

The harbor is but little used and for the draft of vessels entering there are but few dangers in approaching.

In approaching from eastward give the bell buoy off Hyannis entrance a berth of ¼ mile and steer **W.** by **N.** for 4¼ miles, which will lead to the entrance. Red spar buoy will then be abaft the starboard beam, and Lone Rock buoy (can, red and black horizontal stripes) will be ahead.

When Lone Rock buoy is ⅜ mile distant ahead, steer about **NNW.** ½ **W.**, pass midway between red spar buoy No. 4 and black spar buoy No. 1, and anchor in 10 feet close northward of them, or haul sharply to **N.** by **E.** ¼ **E.** and anchor in 7 to 12 feet when ⅛ to ¼ mile from the shore.

If coming from westward bring Succonesset Shoal Light-vessel astern while close to it and steer **NNE.**, leaving Succonesset Shoal buoy (spar, red, No. 18) close-to on the port hand. When ½ mile past the buoy steer **NE.** ¼ **E.** Lone Rock buoy will be made on the port bow and red buoy No. 2 nearly ahead. When ⅜ mile eastward of Lone Rock buoy steer about **NNW.** ½ **W.** and enter as directed above.

FALMOUTH HARBOR.*

This name is applied to the open roadstead on the north shore of Vineyard Sound north of West Chop Lighthouse and about 2½ miles east of Nobska Point Lighthouse. It is frequently used by large vessels with good ground tackle, who prefer the anchorage here to the one in Vineyard Haven on account of the crowded condition of the latter in bad weather. The anchorage in Falmouth Harbor affords a lee in northerly winds, and in heavy southerly gales the sea is somewhat broken by L'Hommedieu Shoal, so that vessels with good ground tackle can ride out a gale in comparative safety. The bottom is generally sticky and good holding ground, shoaling gradually toward the shore; the depth of water at the anchorage ranges from 4 to 6 fathoms.

Prominent features.—Nobska Point Lighthouse is the principal guide to the anchorage. A noticeable yellow bluff, **Falmouth Heights,** is just eastward of the village of Falmouth and about 2¾ miles **ENE.** from Nobska Point Lighthouse; this bluff, on which are numerous houses and a large hotel with large brown conical tower, is prominent, especially in coming from westward.

*Shown on chart 112, scale $\frac{1}{80,000}$, price $0.50.

GENERAL DIRECTIONS FOR THE ANCHORAGE OFF FALMOUTH.

From Eastward.—Following the directions in section 2, page 94, when on the **W. ¾ N.** course from Succonnesset Shoal Light-vessel, continue this course until southward of Falmouth Heights; then haul a little northward and anchor in 4 to 5½ fathoms water, soft bottom, about ¾ mile from the beach.

Or, following the directions in section 2, page 90, when West Chop Lighthouse bears *S.* ½ *E.* steer **N.** ½ **W.**, pass 300 yards westward of black can buoy No. 19, and anchor in 4 to 5½ fathoms water about ¾ mile from the beach.

From Westward.—Standing through Vineyard Sound, when Nobska Point Lighthouse bears about *N.*, distant 1 mile, steer about **NE.** so as to leave the lighthouse at least ½ mile on the port hand. Anchor ¾ mile from the beach when the lighthouse is distant from 1 to 2½ miles.

Remarks.—Light-draft vessels can anchor closer to the shore in 15 to 17 feet water. **New Shoal**, which has 16 feet of water over it and lies westward of L'Hommedieu Shoal, is marked off its western end by black can buoy No. 19, which bears about **E. ¼ S.**, distant 2 miles from Nobska Point Lighthouse. In approaching the shore deep-draft vessels should observe the bearing of Nobska Point Lighthouse, and at night, if less than 2 miles eastward of Nobska Point, they should anchor just before Nobska Point Light comes in range with Tarpaulin Cove Light; if over 2 miles eastward of Nobska Point, vessels should keep well southward of this range.

EDGARTOWN HARBOR.*

This harbor is on the northern side of Marthas Vineyard, just westward of Cape Poge; it is divided into the outer and inner harbors, the former being principally used as a harbor of refuge in southerly and easterly winds and as an anchorage for the night. On the western side of the **outer harbor** are numerous rocks and shoals, which are well marked by buoys and a spindle. There is sufficient room eastward of these for a vessel to work to the anchorage. At the head of the outer harbor a narrow arm makes southward into Katama Bay, forming what is known as the **inner harbor**. This affords good anchorage in 3 to 5½ fathoms, but it is very narrow, and the tidal currents have considerable velocity. The bar south of Edgartown Lighthouse has only 15 feet of water over it. Strangers in sailing vessels seldom enter the inner harbor, as a fair wind is necessary to keep in the channel.

Katama Bay is a large, shallow body of water, only used by local fishermen. It has a shallow channel through which the fishing boats put to sea at high water with a smooth sea.

On the western shore of the inner harbor, and a short distance westward of Edgartown Lighthouse, is the town of **Edgartown**, which has a little commerce and a daily steamer to New Bedford. Some of the wharves have 15 feet of water at their outer ends.

Aids to navigation.—**Cape Poge Lighthouse** is the principal guide for the entrance, and **Edgartown Lighthouse** for the anchorage and entering the inner harbor (see table, page 16). The principal dangers are marked by buoys or spindles, and can easily be avoided.

The channel is free from dangers, and has a least width of ⅛ mile and depth of 4 to 6½ fathoms until nearly up to Edgartown Lighthouse; here it narrows and takes a sharp bend westward, with a depth of 15 feet, leading to the wharves of the town. Abreast the town the channel is narrow and has a depth of 4 to 6 fathoms; it then curves southward, its eastern edge marked by two black buoys, until about ½ mile above the upper wharf in the town, where it widens and has a depth of 3½ to 5 fathoms. This depth continues for 1½ miles into Katama Bay, where it gradually shoals.

Anchorages.—In easterly gales good shelter is found westward of Cape Poge, on the eastern side of the outer harbor. In westerly and southerly gales vessels find shelter in the southern end of the outer harbor, with Edgartown Lighthouse bearing between **W.** and **NW.**, distant about ⅛ mile. Vessels should not anchor in the channel abreast the town, where the bottom is hard sand, the channel narrow, and tidal currents strong. Above the town anchorage is found in the channel, south of Middle Ground Shoal, in 3½ to 5 fathoms, sticky bottom.

Pilots are not required for the outer harbor; a stranger of over 12 feet draft should take a pilot if bound into the inner harbor. Pilots will come out to a vessel making signal for one in the outer harbor.

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*Shown on charts **112**, scale $\frac{1}{80,000}$, price $0.50; **346**, scale $\frac{1}{20,000}$, price $0.25.

Towboats are not used. A towboat is usually stationed at Vineyard Haven or Woods Hole in the winter and can be sent for by telephone from Edgartown.

Supplies.—Coal, in limited quantity, and water can be obtained alongside the wharf. Provisions and some ship-chandler's stores can be had in the town.

Marine Hospital.—Emergency relief is furnished at Edgartown by the U. S. Public Health and Marine-Hospital Service as for stations of Class IV (see Appendix IV).

Currents.—The tidal currents in the narrow part of the channel, inside Edgartown Lighthouse and off the town, have considerable velocity, but as a rule follow the direction of the channel. When the current turns from **E.** to **W.** in the sound off Edgartown, the southerly current is at its strength in the harbor.

Tidal data is given in the table on page 11.

Ice.—Drift ice from the sound, driven into the entrance by the wind, obstructs the entrance of sailing vessels during a part of the winter. The strong tidal currents keep the inner harbor open except for a few days at a time during severe winters.

SAILING DIRECTIONS, EDGARTOWN HARBOR.

The following sailing directions if closely followed are good for a vessel of 18 feet draft to the anchorage eastward of Edgartown Lighthouse, or for a vessel of 14 feet draft to the town wharves.

1. ***Approaching and Entering, from Eastward.***—Passing 100 to 500 yards northward of Cross Rip Light-vessel, steer **W. ¾ N.**, keeping a high dark water tower on Marthas Vineyard ahead on this course. When Cape Poge Lighthouse bears *S.* by *E.* steer **SW. ½ S.**, with Edgartown Lighthouse ahead. When Cape Poge Lighthouse bears *ESE.* ¼ *E.* and black spar buoy No. 1 is in range with it, steer **SSW. ½ W.**, leaving red spar buoy No. 8 about 300 yards on the starboard hand. Anchor in 23 to 31 feet of water with Edgartown Lighthouse bearing between *W.* and *NW.* and distant not more than ½ nor less than ¼ mile.

If of 14 feet or less draft.—When the buoy (spar, red, No. 10) lying about 350 yards *SE.* by *E.* from the lighthouse is made, haul a little westward and leave it close-to on the starboard hand on a **WNW. ½ W.** course. Continue this course up to the wharves, hauling gradually westward and southward.

At night.—From Cross Rip Light-vessel steer **WNW. ½ W.**, heading for East Chop Light, and when Edgartown Light bears **SW. ½ S.**, steer for it and proceed as directed for the daytime.

Remarks.—The **W. ¾ N.** course leads about ⅝ mile north of black spar buoy No. 15, which marks the shoal making northward from Cape Poge.

On the **SW. ½ S.** course the buoy (spar, black, No. 1), westward of Cape Poge will be left ⅝ mile on the port hand, and a number of red buoys will be seen on the western side of the harbor. Edgartown Lighthouse will be ahead, and the houses of Edgartown will be seen westward of it.

The **SSW. ½ W.** course leads for the anchorage; a buoy (spar, black, No. 3) will be left ⅝ mile on the port hand when Edgartown Lighthouse bears about **SW.** by **W.**

On the **WNW. ½ W.** course red spar buoy No. 10 will be left close-to, and the lighthouse about 150 yards on the starboard hand.

Dangers.—**Cape Poge Flats** extend 1⅝ miles northeastward from Cape Poge and are marked near their outer end by a buoy (spar, black, No. 15), which lies about **NE.** from the lighthouse. Vessels of 14 feet draft or more, should pass northward of the buoy; those of less draft can pass southward of it, but should give Cape Poge a berth of at least ¾ mile.

A shoal, with less than 18 feet, extends nearly ½ mile northwestward of Cape Poge, and its western edge is marked by a buoy (spar, black, No. 1) in 21 feet of water.

Sturgeon Flats, with 6 to 15 feet of water over them, make off about 600 yards from the eastern shore of the outer harbor southward of the narrow entrance to Cape Poge Bay. The western edge of the flats is marked by a buoy (spar, black, No. 3), from which the edge of the flats extend in a general **SW. ½ W.** direction to the head of the outer harbor.

On the western side of the harbor is a shoal which extends 2¾ miles in a **NNE.** direction from Edgartown Lighthouse and the shore just westward of the lighthouse. The northern extremity of this shoal lies about 2 miles **NW.** ½ **W.** from Cape Poge Lighthouse and is marked by a black bell buoy which is left on the starboard hand by vessels entering the harbor. Just inside of this buoy is a detached spot with only 11 feet over it. The depth on this shoal is very irregular, and there are a number of rocks with from 3 to 5 feet of water over them. **Allen Rock**, the farthest offshore, lies **WNW.** ⅝ **W.** from Cape Poge Lighthouse and 2 miles **NNE.** from Edgartown Lighthouse, has 4 feet of water over it, and is marked by a buoy (spar, red, No. 2). **Hatsett Rock, Monohansett Rock,** and **Mill Rock,** lying $\frac{3}{16}$ to ½ mile in a general southerly direction from **Allen Rock,** are others of the rocks on this shoal which lie well offshore and which are marked by buoys. The eastern edge of the shoal is marked by a buoy (spar, red, No. 8) lying nearly 1¼ miles **NE.** ⅝ **N.** from Edgartown Lighthouse. Light-draft steamers running between Edgartown, Cottage City, and points westward, cross this shoal, but strangers should not do so.

1 A. ***Approaching and Entering, from Westward.—I. Passing N. of Squash Meadow,*** make good the course **SE.** by **E.** with Nobska Point Lighthouse bearing directly astern until Cape Poge Lighthouse bears **SSE.** ½ **E.**, when steer for it on that bearing. When within about 2 miles of Cape Poge Lighthouse, and Edgartown Lighthouse bears *SSW.* ¾ *W.*, steer **SSW.** When about 400 yards eastward of red spar buoy No. 8, steer about **SSW.** ½ **W.**, and anchor when abreast and eastward of the lighthouse, as directed in section 1.

If desiring to enter the inner harbor proceed as directed under section 1, foregoing.

Remarks.—The **SE.** by **E.** course leads in a nearly parallel direction and about ¾ mile **S.** of Hedge Fence, and the buoy (red and black horizontal stripes) on its western end will be left about ¾ mile on the port hand. When nearing the turn from the **SSE.** ½ **E.** to the **SSW.** course into the harbor, two 18-foot spots will be left nearly ⅝ mile on the port hand.

On the **SSW.** course into the harbor, the buoys marking Allen Rock, Hatsett Rock, Monohansett Rock, and Mill Rock will be left well on the starboard hand, and red spar buoy No. 8 will be made a little on the starboard bow.

Dangers.—**Hedge Fence** and **Squash Meadow** are described on page 90.

Off the entrance are two **18-foot spots,** one 1¾ miles the other 2⅛ miles **N.** by **W.** ⅝ **W.** from Cape Poge Lighthouse.

See also dangers under section 1.

II. Passing S. of Squash Meadow.—Pass about ¾ mile east of East Chop Lighthouse, and bring Cape Poge Lighthouse to bear **SE.** and steer for it. Leave the buoy (can, black, No. 21), marking the western end of Squash Meadow, about 300 yards on the port hand, and when Edgartown Lighthouse bears *SW.* by *S.* steer **SSW.** When about 400 yards eastward of red spar buoy No. 8, steer about **SSW.** ½ **W.**, and anchor when abreast of and eastward of the lighthouse as directed in section 1.

Remarks.—The **SE.** course for Cape Poge Lighthouse leads close northward of the buoy (spar, black, No. 23) off East Chop Flats, and nearly parallel to and about ¼ mile southward of Squash Meadow, the western and eastern ends of which are marked by black can buoys, Nos. 21 and 19 respectively.

After passing East Chop the houses and two landings at Cottage City will be seen. When nearly up to the entrance of the harbor the black bell buoy will be made and it should be left on the starboard hand.

Dangers.—**Squash Meadow** is described on page 90; for other dangers see under section 1, preceding.

VINEYARD HAVEN.*

This harbor is a funnel-shaped bight about 1⅝ miles long in a **NE.** and **SW.** direction and about 1¼ miles wide at the entrance; it is on the northern side of Marthas Vineyard, 12½ miles **WNW.** ⅝ **W.** from Cross Rip Light-vessel, 6½ miles **NW.** from Cape Poge, and 3¾ miles **SE.** from Nobska Point Lighthouse.

The points at the entrance are **East Chop** and **West Chop,** each marked by a lighthouse (see table, pages 16–18). The harbor is easy of access and is the most important and generally used harbor of refuge for coasters between Provincetown and Narragansett Bay; it is exposed to northeastly winds, but vessels with good

* Shown on charts **112**, scale $\frac{1}{80,000}$, price $0.50; **347**, scale $\frac{1}{10,000}$, price $0.25.

ground tackle can ride out any gale. The greatest danger encountered by vessels at anchor in a northeast gale is from vessels with poor ground tackle, which are likely to drift and foul other vessels and then go ashore. The depth is sufficient for the largest vessels passing through Vineyard Sound; it ranges from 35 feet at the entrance to 15 feet near the head of the harbor. On the west shore, near the head of the harbor, is the town of **Vineyard Haven,** which has a little trade and daily communication by steamer with New Bedford. There is 13 feet of water at the end of the wharf at low water. On the east shore are numerous scattered houses and a wharf with 15 feet of water at its end at low water. A road leads from this wharf to Cottage City, which is an important summer resort.

The channel is unobstructed and the lead will be the best guide in selecting an anchorage. When well inside the entrance the water shoals gradually toward the western shore; toward the eastern shore the water shoals more abruptly and the shore should be given a berth of about 300 yards.

Anchorage.—Vessels anchor, according to draft, anywhere from the points at the entrance to the head of the harbor, the light-draft vessels favoring the western shore.

Pilots.—Coasting vessels do not take a pilot to enter the harbor, as the anchorage can be made without difficulty. Pilotage is compulsory for foreign vessels entering to discharge cargo. Pilots for Vineyard and Nantucket sounds can be obtained at Vineyard Haven.

Towboats.—A towboat will usually be found here in the winter.

Supplies.—Coal, in limited quantity, and fresh water can be obtained alongside the wharf for steamers of 15 feet draft or less; steamers of greater draft can have coal brought alongside in lighters. Provisions and some ship-chandler's stores can be had at Vineyard Haven.

Repairs.—There is one marine railway at Vineyard Haven, capacity about 200 tons, where vessels can be repaired. New Bedford is the nearest place at which repairs to the machinery of steamers can be made.

Storm warning displays are made on a staff near East Chop Lighthouse. For an explanation of the signals see Appendix III.

There is a **U. S. Marine Hospital** at Vineyard Haven to which seamen entitled to hospital treatment are sent. For regulations of the U. S. Public Health and Marine-Hospital Service see Appendix IV.

Currents.—The tidal currents have little velocity in the harbor; care should, however, be taken on the ebb, which sets westward, not to approach too closely to West Chop, as the current there sets on the ledges which make eastward and northward from the point.

Tidal data is given in the table on page 11.

Ice.—Both local and drift ice obstruct the movements of vessels in severe winters and at times entirely close the harbor. Strong northerly winds drive drift ice from Vineyard Sound into the harbor and endanger vessels at anchor.

SAILING DIRECTIONS, VINEYARD HAVEN.

Note.—The currents turn about ½ hour earlier inshore across the entrance of the harbor than in the channel through the sound. Vessels entering the harbor, with a head wind or light breeze at the end of a favorable current through the sound, should stand on in the channel until the harbor is well opened before standing in for the anchorage, so as to clear the points at the entrance.

1. ***Approaching and Entering, from Eastward.***—Steer for West Chop Lighthouse on a **WNW. ⅜ W.** bearing until East Chop Lighthouse bears *S.* by *E.*, and then steer **SW. ½ W.** directly into the harbor. Anchor according to draft, 1 mile to ½ mile from the head of the harbor.

Remarks.—On the **SW. ½ W.** course the eastern shore will be given a berth of about 500 yards until the head of the harbor is approached. A buoy (spar, black, No. 1) will be left about 150 yards on the port hand, and red spar buoy No. 4, near the southern end of the harbor, will be a little on the starboard bow. There is excellent anchorage in 20 to 23 feet of water a little northeastward of this buoy.

Dangers.—**Hedge Fence** and **Squash Meadow,** northeastward and eastward of the entrance, are described on page 90.

East Chop Flats have 8 to 18 feet of water over them and extend a little over ⅝ mile in a northeasterly direction from East Chop, and are marked off their northeastern end by a buoy (spar, black, No. 23).

Canal Flats, with 3 feet of water over them, make off 300 yards from the eastern shore of the harbor, about 1 mile inside of East Chop Lighthouse; their northwestern edge is marked by a buoy (spar, black, No. 1).

1 A. ***Approaching and Entering, from Westward.***—Passing Tarpaulin Cove Lighthouse, bring it to bear *W.* ¼ *S.* astern and steer **E.** ¼ **N.** When East Chop Lighthouse bears **SE.** by **S.**, steer for it until West Chop Lighthouse bears *W.* by *N.*, then steer **SSW.** ¾ **W.** for the anchorage and anchor as directed in section 1, foregoing.

Remarks.—The **E.** ¼ **N.** course leads ⅛ mile northward of the Middle Ground. When West Chop Lighthouse bears about **SE.** ¾ **E.** East Chop Lighthouse will open from behind it. On the **SE.** by **S.** course the buoys marking the shoals off West Chop will be left about ¼ mile on the starboard hand.

On the **SSW.** ¾ **W.** course the wharf on the eastern side of the southern part of the harbor and the Marine Hospital buildings farther back (and quite prominent) will be a little on the starboard bow.

See the note preceding section 1.

Dangers.—The **Middle Ground** westward of West Chop is described on page 91.

Shoals make off ¼ mile northward and eastward from West Chop; the edge of these shoals is marked by two buoys. West Chop buoy (spar, black, No. 25) is colored and numbered for the channel through Vineyard Sound; Low Point Flats buoy (nun, red, No. 2) is a guide for entering the harbor.

Alleghany Rock, with 6 feet of water over it, lies about 650 yards **N.** ¼ **E.** from West Chop Lighthouse, near the edge of the shoals; West Chop buoy is placed just north of the rock. A rock, awash at low water, lies ⅜ mile **SE.** ¾ **E.** from West Chop Lighthouse, near the eastern edge of the shoals, and several sunken rocks and rocks awash at low water lie inshore of it.

See also dangers under section 1, foregoing.

WOODS HOLE.*

This is a narrow passage, between the mainland and the easternmost of the Elizabeth Islands, leading from Vineyard Sound into Buzzards Bay; on its northern side are two coves known respectively as Little Harbor and Great Harbor. Woods Hole is little used as an anchorage on account of the strong tidal currents and the difficulty of entering or leaving except with a fair wind. The entrance from Vineyard Sound is westward of Nobska Point, between it and Nonamesset Island, and is about ⅞ mile wide; the whole of this width is not available as an entrance for vessels, as numerous rocks and shoals make out from both shores and lie in the middle of the entrance, leaving two narrow, buoyed channels. The passage through into Buzzards Bay is very narrow and has a depth of 9 feet. Although it is well marked by buoys, the tidal currents are so strong as to make even the passage of steamers dangerous without some local knowledge; the buoys in the narrowest parts of the channel are sometimes dragged under by the currents at strength. A stranger should not attempt to pass through without a pilot.

Little Harbor is the easternmost of the two coves in the north shore of the passage; it has a small anchorage with 9 to 12 feet water. A channel 130 feet wide and 10 feet deep was dredged to the anchorage and to the wharf of the lighthouse depot, which is on the western side of the cove, but the best depth is about 9 feet at low water. The village of Woods Hole is at the head of the cove and along the eastern shore of Great Harbor.

Great Harbor is about ½ mile long **NW.** and **SE.**, and nearly ¼ mile wide; its depth is irregular, ranging from 3½ to 12 fathoms in the channel, and the holding ground is mostly poor. On the eastern side of the harbor is the wharf and depot of the New York, New Haven and Hartford Railroad, and above this is the wharf, basin, and large buildings of the **U. S. Fish Commission,** which are prominent when entering from southward.

Channel.—The channel from Great Harbor to Buzzards Bay has a narrow but straight reach (the northern) at its eastern end and a broader reach (the southern), necessitating a sharp turn. The straight reach should be given the preference on account of the difficulty of handling a vessel in the strong currents.

Storm warning displays of the U. S. Weather Bureau are made on Nobska Point, near the lighthouse. (See Appendix III.)

A **time ball** is dropped daily, Sunday excepted, on a staff on the tower at the Fish Commission buildings, at 12 h. 00 m. 00 sec. of 75th meridian time, 5 h. 00 m. 00 sec. Greenwich mean time. This time signal can be seen by vessels at anchor in Great Harbor.

Tidal data is given in the table on page 11.

Currents.—The currents in the passage through Woods Hole have a greatest velocity of 5 miles during neap and 8 miles during spring tides and are somewhat influenced by the wind. Slack water is of short duration, and the current from Vineyard Sound into Buzzards Bay (west current) begins to run about 45 minutes before high water at Boston. The average duration of the west current is 5 h. 53 m. and of the east current 6 h. 32 m. These times are subject to a variation of as much as one hour, due principally to the wind.

*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50; **348**, scale $\frac{1}{10,000}$, price $0.25.

In the upper part of Great Harbor, near the Fish Commission wharf, the currents are barely perceptible and vessels at anchor lie head to the wind.

The mean rise and fall of tides in the passage is 2½ feet.

Ice.—The strong tidal currents usually keep the harbor open. Drift ice is brought through from Buzzards Bay, but seldom interferes with navigation, except in unusually severe winters, when it may close the entrance from that bay.

SAILING DIRECTIONS, WOODS HOLE TO AN ANCHORAGE IN GREAT HARBOR.

The directions in sections 1 and 1 A, if closely followed, will carry a least depth of over 3 fathoms at low water. Strangers should not attempt to enter except in the daytime with clear weather.

1. ***Approaching and Entering, from Eastward.***—Steer so as to pass about ½ mile southward of Nobska Point Lighthouse, and close to the red bell buoy off the point. Then steer **WNW. ¼ W.** until Woods Hole is opened, and the cupola of the Fish Commission building bears **N.**; steer for the cupola and keep it on that bearing. The black gas-lighted buoy at the entrance will be left about 120 yards on the port hand, red spar buoy No. 2 about 75 yards on the starboard hand, and red spar buoy No. 4 nearly 300 yards, and red spar buoy No. 6 about 50 yards, on the starboard hand.

When red spar buoy No. 6 is on the quarter, steer about **NNW. ¼ W.**, and leave the end of the Fish Commission wharf 75 yards on the starboard hand. Anchor 200 yards northwestward of the Fish Commission wharf in 5 to 8 fathoms.

Vessels of 7 feet or less draft may pass 300 yards south of Nobska Point, and steer **NW.** by **W. ¼ W.**, so as to pass about 200 yards south of Parkers Neck, leaving Coffin Rock and Great Ledge buoys well on the port hand and red spar buoy No. 4, off Parkers Neck, about 50 yards on the starboard hand. When the end of the railroad wharf shows well clear of the western shore of Parkers Neck, steer **N.** by **W. ¼ W.**, heading for the end of the Fish Commission wharf, and so as to leave red spar buoy No. 6 about 50 yards on the starboard hand. Give the end of the wharf a berth of 75 yards, and anchor 200 yards northwestward of it in 5 to 8 fathoms.

Remarks.—Passing south of Nobska Point, the bell buoy southward of the point can be left on either hand. When westward of the point a lookout should be kept for the black gas-lighted buoy on the western side of the entrance and the red spar buoy eastward of it. When between these buoys and steering **N.** for the Fish Commission building, the railroad wharf will be on the starboard bow, and red spar buoy No. 6 will be made a little on the starboard bow. On the port bow several buoys and a spindle, marking the two channels of the passage into Buzzards Bay, will be seen. The current from Buzzards Bay has a tendency to set vessels eastward.

On the **NNW. ¼ W.** course black spar buoy No. 3 is left on the port hand. Care must be taken to give the end of the Fish Commission wharf a good berth when the current is setting eastward through the passage and on to the end of the wharf. There is very little current northward and northwestward of the wharf, and vessels at the anchorage usually swing with the wind.

Dangers.—**Ledges**, showing partly bare at low water, make out 150 yards southward and southwestward from Nobska Point.

Coffin Rock, a small, detached rock with 5½ feet water over it, lies ⅜ mile **WSW.** from Nobska Point Lighthouse and is marked off its southeastern side by a buoy (spar, black, No. 1).

Great Ledge, with 1½ to 9 feet water over it, is about 200 yards in diameter and lies nearly ⅜ mile **W. ¾ S.** from Nobska Point Lighthouse. It is marked off its southwestern end by a buoy (spar, red, No. 2).

There is a **small spot**, with 11 feet water over it, about 175 yards **SW.** by **S.** from the buoy on Coffin Rock.

Nonamesset Shoal has depths of 10 to 16 feet over it and makes out ¼ mile eastward from the island on the western side of the entrance to Great Harbor. The southeastern end of the shoal is marked by a buoy (black, gas-lighted).

Parker Flats make off 200 yards from the shore southward of the railroad wharf and are marked off their western edge by a buoy (spar, red, No. 6).

Red Ledge and **Grassy Island** lie on the western side of the harbor opposite Parker Flats. The passage known as "**Lone Rock Passage**" leads between these dangers and is marked by a spindle and two buoys. The northern

end of the ledges surrounding Grassy Island is marked by a buoy (spar, black, No. 3). The channel to the anchorage in Great Harbor leads between this buoy and the end of the Fish Commission wharf.

The northwestern end of the harbor is shoal, with depths of 5 to 9 feet.

1 A. ***Approaching and Entering, from Westward.***—When abreast of Tarpaulin Cove Lighthouse, steer for Nobska Point Lighthouse, course about **NE.** by **E.** ½ **E.** When about 1 mile distant from Nobska Point Lighthouse watch the bearing of the cupola on the Fish Commission building and when it bears **N.** steer for it, passing midway between the black gas-lighted buoy and red spar buoy No. 2. Leave red spar buoy No. 6, which should be made on the starboard bow, about 50 yards on the starboard hand, and proceed as directed in section 1, foregoing.

Remarks.—When standing for Nobska Point Lighthouse, there are no dangers to look out for until up to Nonamesset Shoal; the shore of the islands should be given a berth of ¼ mile.

See the remarks and dangers under section 1, foregoing.

GENERAL DIRECTIONS, FROM GREAT HARBOR TO BUZZARDS BAY.

These directions are for small steamers of less than 9 feet draft, with sufficient power to be handled in strong currents.

Following the directions for entering Great Harbor, when the vessel is nearly up to Parker Flats buoy (spar, red, No. 6) a red spar buoy and a black spar buoy will be seen on the port beam, the red buoy being just southward of an iron spindle with a lantern. Turn sharply westward so as to pass midway between these buoys on a **W.** course, heading so as to leave a black nun buoy (No. 1) about 20 yards on the port hand; continue the **W.** course and leave a black spar buoy (just north of a spindle with two lanterns) about 25 yards on the port hand.

When the latter buoy is 200 yards distant on the port quarter, steer **NW.** by **W.** ¾ **W.** for the north end of Uncatena Island, and when the western tangent of Long Neck (the land on the starboard hand) bears abeam (*NNE.* ¼ *E.*), and red spar buoy No. 4 is in range with this tangent, steer **N.** by **W.** ½ **W.** and leave black spar buoy No. 5 about 250 yards on the port hand. Having stood nearly ¾ mile on the **N.** by **W.** ½ **W.** course; then—

Bound up Buzzards Bay or to Wareham, steer **N.** by **E.** ⅛ **E.** about 8 miles and follow the directions under those headings.

Bound to Mattapoisett, continue the **N.** by **W.** ½ **W.** course 6 miles, and follow the directions for Mattapoisett Harbor.

Bound to New Bedford, steer **NW.** by **W.** ¾ **W.** so as to pass ¼ mile north of Weepecket Rock and the buoy marking it. Continue on the **NW.** by **W.** ¾ **W.** course a total distance of about 7⅜ miles until up to the bell buoy off Mosher Ledge, and then follow the directions for New Bedford Harbor under that heading.

TARPAULIN COVE*

is a small bight in the south shore of Naushon Island, about 5 miles **WSW.** ¼ **W.** from Nobska Point Lighthouse; it affords shelter from northerly and northwesterly winds and is frequently used as an anchorage by vessels headed off by the wind or meeting a strong head tide, or as an anchorage for the night when passing through Vineyard Sound. The depth at the entrance is about 5 fathoms, and inside it is 15 to 18 feet, decreasing gradually toward the head of the cove; the bottom is good holding ground. The western point at the entrance is marked by **Tarpaulin Cove Lighthouse** (see table, page 18), and two buoys are placed to guide clear of rocks near the western shore of the cove.

Storm warning displays of the U. S. Weather Bureau are made at Tarpaulin Cove; for explanation of their meaning see Appendix III.

*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50.

SAILING DIRECTIONS TO AN ANCHORAGE IN TARPAULIN COVE.

Good anchorage in 14 feet water can be found in the cove with Tarpaulin Cove Lighthouse bearing southward of *SW*. Deep-draft vessels should anchor with the lighthouse bearing westward of *SW*.

1. ***Approaching and Entering, from Eastward.***—When passing West Chop give it a berth of 1 mile and steer about **W.** As soon as Tarpaulin Cove Lighthouse is made steer for it, keeping it bearing southward of **W.** so as to clear the Middle Ground, and give the northern shore of the sound a berth of at least ¼ mile. When a little more than ½ mile distant from Tarpaulin Cove Lighthouse haul a little northward and anchor according to draft, giving the shores a berth of at least 250 yards.

Dangers.—Both shores should be given a berth of at least 150 yards when entering, as rocks and bowlders lie nearly that distance from shore.

Cove Rock lies nearly 300 yards **NE.** by **E.** ½ **E.** of Tarpaulin Cove Lighthouse, and is marked off its southern side by a buoy (spar, black, No. 1).

A rock, with only 1 foot over it at low water and 7 to 9 feet around it, lies 300 yards **NE.** ¼ **N.** from Tarpaulin Cove Lighthouse, and about 80 yards from shore.

Single Rock, with 8 feet over it at low water, in a surrounding depth of 12 to 13 feet, lies 700 yards **N.** ½ **E.** from Tarpaulin Cove Lighthouse, and is marked off its southeastern side by a buoy (spar, red and black horizontal stripes.

1 A. ***Approaching and Entering, from Westward.***—Stand eastward, keeping Gay Head Lighthouse bearing southward of **SW.** to clear Lucas Shoal, and give the northern shore of the sound a berth of ⅜ mile until past Robinsons Hole. When Tarpaulin Cove Lighthouse is made, steer so as to give the shore southward and eastward of it a berth of at least ¼ mile, and then haul northward; stand in and anchor according to draft.

At night vessels should steer **NE.** by **E.** ½ **E.** for Nobska Point Light, until Tarpaulin Cove Light is made.

Remarks.—Tarpaulin Cove Light is shut in by the trees southwestward of it, and can not be seen at night until it bears about **NE.**

ROBINSONS HOLE AND QUICKS HOLE.*

Robinsons Hole is a narrow passage from Vineyard Sound to Buzzards Bay, leading between Naushon Island and Pasque Island; the southern entrance lies 2½ miles westward of Tarpaulin Cove. This passage is buoyed and deep, but is narrow, full of rocks and ledges, has strong tidal currents, and should never be attempted by a stranger; local fishermen sometimes pass through it.

Quicks Hole, leading between Pasque Island on the east and Nashawena Island on the west, is the only passage from Vineyard Sound into Buzzards Bay eastward of Cuttyhunk available for a stranger of 9 feet or more draft. It lies about 4 miles westward of Tarpaulin Cove and is about ⅝ mile wide, with a clearly defined entrance which bears **N.** ¾ **E.** from Gay Head Lighthouse. The channel is nearly straight, has a width of 700 yards, and is marked by buoys. The general depth is over 5 fathoms, but there are several spots with 18 feet over them, and a number with depths of 24 to 27 feet. Vessels seeking shelter in strong westerly gales sometimes anchor in Quicks Hole, toward the western side of the passage and about ¼ mile **WSW.** from Quicks Hole Ledge buoy.

The **tidal currents** have considerable velocity, and a sailing vessel should not attempt to pass through unless with a strong favorable wind or a favorable current. When the current is setting westward through Vineyard Sound it is setting north through Quicks Hole, and vice versa. Strong winds affect the regularity of the currents.

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*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50; **345**, scale $\frac{1}{10,000}$, price $0.25.

SAILING DIRECTIONS, QUICKS HOLE.

Strangers should not attempt to pass through Quicks Hole at night. The following directions, if closely followed, lead in the best water and are good for a draft of 26 feet.

1. ***Passing through from Southward.***—Standing through Vineyard Sound, when Gay Head Lighthouse bears *S.* ¾ *W.* the entrance will be fairly opened. Steer northward so as to enter about midway between Pasque and Nashawena islands, and when nearly ⅝ mile eastward of the black bell buoy at the entrance, bring *North Rock* (the small, bare rock about 100 yards off the northeastern point of Nashawena Island) to bear **NNW.** ¼ **W.** and steer for the rock on this bearing. Leave Nashawena Flats buoy (spar, black, No. 1) about ¼ mile on the port hand, and when the tangents of the southern points of Pasque Island are in range, bearing *E.* ½ *S.*, steer **N.** ¼ **W.** so as to leave Quicks Hole Ledge buoy (nun, red, No. 2) about 100 yards on the starboard hand. Continue on this course until North Rock bears *W.*, and then steer **N.** by **E.** ¼ **E.** into Buzzards Bay, leaving Lone Rock buoy (nun, red and black horizontal stripes) about ¼ mile on the port hand.

Vessels of less than 20 feet draft.—A black bell buoy lies off the entrance about ½ mile *SE.* by *S.* from the southeastern end of Nashawena Island; a **N.** course made good from this buoy will lead close westward of red nun buoy No. 2 and about 350 yards eastward of Lone Rock buoy.

Remarks and dangers.—The tidal currents have considerable velocity, and deep-draft vessels must be careful not to be set off the courses. There are a number of detached 18-foot spots in the passage, but these are avoided by closely following the directions which lead eastward of them.

Nashawena Flats, with 7 to 12 over them, make off ¼ mile in a **SE.** direction from the southeast point of Nashawena Island, and are marked at their end by a buoy (spar, black, No. 1).

Quicks Hole Ledge is the extensive shoal, with bowlders, which makes off ¼ mile from the western shore of Pasque Island. Near its western edge are a number of spots with 4 feet over them, and just westward of these the edge of the shoal is marked by a buoy (nun, red, No. 2).

A **small 18-foot spot** lies ¼ mile from the eastern shore of Nashawena Island, and a little over ¼ mile **SSW.** from red nun buoy No. 2.

Felix Ledge consists of several spots with 18 feet over them, lying nearly ¼ mile from the eastern shore of Nashawena Island and ¼ mile **NW.** from red nun buoy No. 2.

Shoals make off for a distance of 350 yards from the eastern shore of Nashawena Island.

Lone Rock has 6 feet over it, and lies nearly ¾ mile **N.** by **E.** ¾ **E.** from the northeast point of Nashawena Island. A buoy (nun, red and black horizontal stripes) is placed off the north side of this rock, and there is foul bottom with depths of 15 to 23 feet for a distance of ¼ mile southward of this buoy. In 1903 a bell buoy temporarily marks Lone Rock.

1A. ***Passing through from Northward.***—When 1 mile or more north of the entrance, and Gay Head Lighthouse can be seen in the middle of the opening between Pasque and Nashawena Islands, steer **S.** ½ **W.**, taking care to pass nearly ¼ mile eastward of Lone Rock buoy, and heading so as to pass 100 yards westward of red nun buoy No. 2. When the latter buoy is abeam, steer **S.** by **E.** and leave black spar buoy No. 1 and the black bell buoy about 350 yards on the starboard hand.

Remarks and dangers.—Approaching from northward care must be taken to avoid Lone Rock.

On the **S.** ½ **W.** course Gay Head Lighthouse will be ahead, and the southeastern point of Nashawena Island a little on the starboard bow. Pasque Island, on the port hand, should not be approached closer than ¼ mile, and the red nun buoy should be made on the port bow.

On the **S.** by **E.** course black spar buoy No. 1 and the black bell buoy should be on the starboard bow and be left well on the starboard hand.

See also the remarks and dangers under section 1, preceding.

BUZZARDS BAY*

indents the south shore of Massachusetts in a general **NE.** direction north of the Elizabeth Islands, the latter separating the bay from Vineyard Sound. The shores are irregular, being broken by bays and rivers, which, with the exception of New Bedford Harbor and Wareham River, are of little importance. The general character of the shore is rocky; large bowlders are a prominent feature, and in some places extend out some distance into the bay, rendering close approach to the shore dangerous.

The bay has deep water as far as Wings Neck Lighthouse, above which it is full of shoals. The entrances to the harbors are more or less obstructed by shoals and dangerous ledges, but the channels are marked by buoys or other aids.

There are four entrances to the bay, two of which, the main entrance and Quicks Hole, are used by sailing vessels. Woods Hole, Robinsons Hole, and Quicks Hole, the entrances from Vineyard Sound, are described on pages 106–110.

The western and main entrance is northward of Cuttyhunk Island, between it and Gooseberry Neck. Between these points it is about 5½ miles wide, but the ledge making westward from Cuttyhunk and another making southward from Gooseberry Neck leave an available width of 4¼ miles. The bottom in this entrance is irregular and rocky; spots with 3¾ to 5¾ fathoms (on which the sea breaks in heavy southwest gales), surrounded by deeper water, lie between Cuttyhunk and Old Cock Spindle, off Gooseberry Neck, so that extra caution is necessary for vessels of 22 feet or more draft when entering the bay. Cuttyhunk Lighthouse and Hen and Chickens Light-vessel are the guides for entering, and Gay Head Lighthouse and Vineyard Sound Light-vessel serve as guides for vessels approaching from southward.

New Bedford Harbor, Clark Cove, Apponaganset Bay, Mattapoisett Harbor, Sippican Harbor, Pocasset Harbor, Wareham River, and the extreme northeastern end of the bay are described under separate headings.

Cataumet, Wild, Hog Island, and Quamquisset harbors are small and shallow indentations along the eastern shore of Buzzards Bay, their relative positions being in the order named, beginning with the most northerly, which is about 8 miles northeastward of the northern entrance to Woods Hole. They are only available for small craft in the daytime, and are of no commercial importance. At mean low water 8½ feet may be taken into Cataumet Harbor, while the depth in the channels to the others varies from 5 to 7 feet at mean low water. The dangers in Cataumet and Quamquisset harbors are buoyed in accordance with the general system of buoyage in United States waters.

Pilots for Buzzards Bay and for many of its harbors can be had at Cuttyhunk or off the entrance of the harbor to which the vessel is bound. Pilotage is compulsory for certain vessels (see pilot laws in Appendix II).

Tides.—Tidal data for different points in the bay is given in the table on page 11.

Tidal currents at the entrance of the bay have considerable velocity at times when they are influenced by the winds. In the passages from the bay to Vineyard Sound the currents have great velocity, and require special attention.

Ice.—The head of the bay and the harbors in its vicinity are generally closed to navigation during the winter months, and the approaches to the harbors on the eastern shore are rendered dangerous by drift ice, which in severe winters extends across the bay and joins the local formations on the western shore, thus forming an impassable barrier. In the severe winter of 1874–75 the whole bay was closed during the greater part of the month of February as far down as a line from Dumpling Rock Lighthouse to Cuttyhunk Island. It forms more rapidly in the bay with the wind from **N.** to **W.** Under ordinary circumstances a **NE.** wind, if continued for 48 hours, will clear the bay of ice. Southerly winds, especially southeasters, diminish the extent and weaken the strength of the pack. The ice does not usually affect the positions of the spar buoys in the bay, but the light-vessels, and even the buoys, are sometimes carried away by unusually heavy floes.

In New Bedford Harbor steamers can generally make their way in and out during the winter, but sailing vessels require the assistance of a powerful towboat to break the ice. During very severe winters, however, the harbor is at times entirely closed to all navigation. Ice forms rapidly in calms or light winds from **N.** to **W.**, and strong winds from **N.** to **NE.** break it up and carry it off.

SAILING DIRECTIONS, BUZZARDS BAY TO WINGS NECK LIGHTHOUSE.

A draft of 20 feet can be taken up to abreast Wings Neck Lighthouse by following the directions in section 1 A or 1 B. By closely following the directions in section 1 B the

* Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50. The western entrance is shown on chart **113**, scale $\frac{1}{80,000}$, price $0.50. See also footnote on page 9.

deepest-draft vessels can be taken into the bay a distance of 14 miles above Cuttyhunk Island. See the remarks on approaching Vineyard Sound, Buzzards Bay, or Narragansett Bay from sea, page 28.

1. ***From Woods Hole.***—Having passed through Woods Hole, as directed on page 108, when Naushon Point Shoal buoy (spar, black, No. 5) bears on the port beam, distant about 100 yards, steer **N.** by **E.** ⅛ **E.** about 9¼ miles. Wings Neck Lighthouse should then bear *E.* by *S.*, distant 1⅝ miles.

Remarks and dangers.—Having stood on this course about 7 miles, Cataumet Harbor will be open on the starboard hand. The sailing line passes about 1¼ miles westward of the buoys marking Southwest Ledge, the shoals between the entrances to Cataumet and Pocasset harbors, and nearly 1 mile eastward of Bird Island Lighthouse. To avoid the ledges making off from the eastern shore it should be given a berth of at least 1 mile.

There is a **rocky spot** with 17 and 18 feet over it, lying about 1¼ miles **W.** ⅛ **N.** from Nyes Neck, the point at the southern side of the entrance to Cataumet Harbor.

Cleveland Ledge is a small, rocky spot with 16 feet of water, lying 2¼ miles **W.** ⅝ **N.** from Nyes Neck.

1 A. ***From Quicks Hole.***—Having passed through Quicks Hole from Vineyard Sound as directed on page 110, when Lone Rock buoy (nun, red and black horizontal stripes) is on the port beam, distant about 350 to 500 yards, steer **NE.** ⅜ **N.** about 14¾ miles. Wings Neck Lighthouse should then bear *E.* by *S.*, distant 1¼ miles.

Remarks.—This course leads clear of all dangers and nearly in the middle of the bay; having stood on it about 10 miles Mattapoisett Harbor will be off the port beam, and having stood on 2¾ miles farther, Sippican Harbor will be open forward of the port beam. Bird Island Lighthouse should be left about ¾ mile on the port hand. **Tempes Knob**, a high, wooded hill at the head of the bay, will be a very little on the port bow.

1 B. ***From Hen and Chickens Light-vessel.***—*I. Vessels of more than 22 feet draft.*—Vessels when southward of Hen and Chickens Light-vessel should head for it on any bearing between **N.** ½ **W.** through *N.* to **NE.** ½ **N.**

Vessels when westward of Hen and Chickens Light-vessel should bring it to bear between **E.** ¼ **S.** and **E.** ½ **S.** and steer for it between these bearings.

Give the light-vessel a berth of about ¼ mile, and bring it to bear *S.*, distant ⅜ mile; then make good an **E.** by **N.** course for 9¼ miles. The old white light-tower on Clark Point should then bear *NNW.*, distant 5½ miles, and Dumpling Rock Lighthouse bear *NW.* by *W.* ¼ *W.*, distant 4¼ miles. From this position a **NE.** by **E.** course for a distance of 8 miles will lead in a depth of over 6 fathoms.

Remarks and dangers.—Soundings of 5 and 5¼ fathoms are found from 1½ to ¾ mile southwestward of Hen and Chickens Light-vessel, and these are avoided by standing for the light-vessel on the bearings given above. There is a black whistling buoy ¾ mile **SW.** by **W.** ⅜ **W.** from the light-vessel. When the vessel is ⅜ mile **N.** of the light-vessel, Hen and Chickens buoy (spar, black, No. 1) will be about ⅜ mile distant to the northwestward, and Old Cock spindle will be seen ¼ mile northwestward of the buoy.

Sow and Pigs Reef, with spots showing bare at low water, extends 1⅜ miles in a general **WSW.** ¼ **W.** direction from the western end of Cuttyhunk Island. The western end of the reef is marked by a buoy (nun, red, No. 2, with "S. & P." on side).

Hen and Chickens is the ledge making off nearly 1½ miles southward from **Gooseberry Neck**, the point on the northern shore at the entrance to Buzzards Bay northward of Hen and Chickens Light-vessel. It has a number of spots with 4 to 9 feet over them, and near the southern end are several rocks which show bare at half tide. **Old Cock**, one of these rocks, is 8 feet out at low water and marked by a spindle (black, openwork cage on top). The southernmost end of the ledge is marked by a buoy (spar, black, No. 1) which lies about ¾ mile **NNW.** ½ **W.** from Hen and Chickens Light-vessel.

On the **E.** by **N.** course Mishaum Ledge bell buoy (black) should be left a little over ¼ mile on the port beam. Dumpling Rock Lighthouse should be 2¾ miles distant when it is abeam, and Wilkes Ledge buoy (can, red and black horizontal stripes) should then be about 1 mile distant and nearly in range with the lighthouse. Care should be taken not to be set northward on this course.

Ribbon Reef is a small, detached ledge with 18 feet over it, lying 1½ miles **NW. ⅝ N.** from Cuttyhunk Lighthouse. It is surrounded by deep water and marked off its northern side by a buoy (nun, red and black horizontal stripes). About 1¼ miles **N.** from Ribbon Reef is a detached spot with 25 feet over it, on which the sea breaks in heavy southwest gales. It lies about 1¾ miles **E. ¾ S.** from Hen and Chickens Light-vessel.

Mishaum Ledge is a number of shoal, rocky spots, one of which has a depth of 8 feet over it. The ledge lies 1½ miles off the northern shore and about 3 miles eastward of Gooseberry Neck: it is marked off its southeastern end by a black bell buoy. Strangers should pass southward of this buoy.

There is a detached rock with 23 feet over it lying nearly 1 mile **NW.** by **N.** from the northern end of Penikese Island, and another detached rocky spot with 18 feet over it about ¼ mile **N.** by **E.** from the northern end of the island. The channel between the northernmost of these rocks and Mishaum Ledge is about 1½ miles wide.

Wilkes Ledge is a detached, rocky spot about ⅜ mile in diameter, with less than 24 feet over it, and a least depth of 9 feet; it lies 1¾ miles **S. ¼ E.** from Dumpling Rock Lighthouse. It is marked off its southern side by a buoy (can, red and black horizontal stripes).

II. Vessels of 22 feet or less draft.—Steer for Hen and Chickens Light-vessel, keeping it bearing between **E. ½ S.** through *E.* and *N.* to **N.** by **W. ½ W.** Leave the light-vessel on either hand, bring it to bear *WSW.* ½ *W.* astern, and steer **ENE. ½ E.**, keeping the bearing. Continue on this course about 11½ miles, passing ⅝ mile south of the bell buoy off Mishaum Ledge and Wilkes Ledge buoy, and 1¾ miles *S.* of West Island Shoal buoy. When Clark Point old light-tower bears *NW.*, steer **NE. ⅝ N.** about 9½ miles. Wings Neck Lighthouse should then bear *E.* by *S.*, distant 1¼ miles.

Remarks.—If passing northward of Hen and Chicken Light-vessel, give it a berth of less than ½ mile. When about 5 miles eastward of the light-vessel on the **ENE. ½ E.** course, Dumpling Rock Lighthouse will bear about **N.** by **E.**, distant 2½ miles. The entrance to New Bedford Harbor will be left on the port hand and the old white tower on Clark Point will be seen. The large black can buoy off West Island Shoal can be seen a long distance. The **NE. ⅝ N.** course leads well clear of all dangers and about ¾ mile eastward of Bird Island Lighthouse.

NEW BEDFORD HARBOR.*

This harbor lies on the northwestern side of Buzzards Bay, and is the approach to the city of **New Bedford** and the towns of **Fairhaven** and **Acushnet**. The approach from Buzzards Bay and the entrance to the harbor are much obstructed by ledges and shoals. These, however, are well marked by buoys and other aids, so that in the daytime with clear weather no difficulty should be experienced in entering if assisted by the chart or sailing directions. Sailing vessels should not attempt to beat into the harbor unless well acquainted with the dangers. The approach between Sconticut Neck on the east and **Dumpling Rock Lighthouse** on the west is nearly 4 miles wide, and also serves as the approach to Apponaganset Bay and Clark Cove. The entrance to the harbor on its western side is marked by **Butler Flats Lighthouse** (see table, page 18), and 1½ miles **N.** by **W. ¼ W.** from this by **Palmer Island Lighthouse**; on its eastern side are extensive shoals, which are marked by a large white stone beacon.

The channel, for a distance of ½ mile south of Palmer Island Lighthouse to the anchorage off New Bedford, is comparatively narrow, but is well marked by buoys and a range. At the head of the harbor, crossing the mouth of the Acushnet River, is a bridge with a draw, east of Fish Island, 100 feet wide in the clear. The principal water-borne trade of New Bedford is coal, cotton, and whale oil, and the greatest draft of vessels entering the inner harbor is about 21 feet. There is 16 to 22 feet of water alongside the wharves, according to location. The greatest draft taken up to Wamsutta Mills is about 14 feet at high water.

Channels.—The channel from the deep water off Clark Point to the wharves at the city of New Bedford has been improved, under the supervision of the U. S. Army Engineers, and a channel 18 feet deep and 200 to 250 feet wide leads up to the city wharves and through the draw of the Fairhaven bridge to the wharves on Fish Island. There are several channels leading up to Clark Point between the ledges which are described in connection with the sailing directions.

Ranges.—*Eastern channel ranges.*—Egg Island beacon (granite cone, spindle and vane on top), bearing **N. ¾ W.**, and in range with Rodgers House (a large white building with small black-topped cupola, in Fairhaven), will lead in a least depth of 30 feet until abreast Packet Rock. Egg Island beacon, bearing **N. ⅛ W.**, and in range with Rodgers School (large red building with pointed red cupola, in Fairhaven), will lead in a least depth of 30 feet, but between Brooklyn Rock and the 18-foot spot east of North Ledge. Eastern Channel

*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$; **252**, scale $\frac{1}{20,000}$, price of each $0.50.

Range beacon (a white pyramidal beacon on the beach south of Rodgers House) bearing **N. ½ W.** Westerly, and in range with a low, dark, flat-topped church tower with pointed corners, in Fairhaven, will lead close to Brooklyn Rock, and is not safe for vessels of over 16 feet draft. The range for entering at night is Palmer Island light, showing just clear eastward of Butler Flats Light, which leads 300 yards eastward of Hursell Rock buoy and 250 yards westward of Henrietta Rock buoy and up to the anchorage south of Butler Flats Light. This range (if visible) may be used in the daytime, carrying a least depth of 26 feet from Hursell Rock to the anchorage.

Middle channel ranges.—Egg Island beacon, bearing **N.** by **E. ⅛ E.**, and in range with the large, high, water tower in Fairhaven, will carry a least depth of 23 feet until nearly up to Clark Point. The old white light-tower on Clark Point, bearing **N.** by **E. ⅛ E.**, and in range with Rodgers House (large white building with small black-topped cupola, in Fairhaven), leads in a least depth of 24 feet until nearly up to Clark Point.

Inner harbor range.—Palmer Island Lighthouse, in range with the square tower on Wamsutta Mills (nearly over the middle of the draw in Fairhaven bridge), leads from abreast Butler Flats into the dredged channel eastward of Palmer Island, and carries a least depth of 18 feet; at night a white electric light is shown on the corner of the tower.

Anchorages.—The anchorage in what is known as the outer harbor, eastward and southward of Clark Point, has depths of 4 to 5 fathoms, but is exposed to southerly winds. The anchorage above Palmer Island has a limited area with a depth of about 23 feet, known as Deep Hole; the remainder has depths from 8 to 15 feet. This anchorage is well sheltered and has good holding ground. Light-draft vessels can anchor on the western side of the harbor, giving the wharves a berth of about 150 yards.

Pilots are generally taken by large vessels, and may be had by signaling off Cuttyhunk Lighthouse. In good weather pilots may board incoming vessels as far south as No Mans Land. For pilot laws and rates see Appendix II.

Towboats are generally taken by sailing vessels wishing to enter the inner harbor, and will come out to a vessel making the signal. A lookout for incoming vessels is kept by the towboat captains when they are not cruising.

Harbor regulations for the port are enforced by the harbor master, and are contained in the extracts from the laws of the Commonwealth of Massachusetts, under the heading "Harbor Control," in Appendix II.

Quarantine regulations.—See Appendix II.

Marine Hospital.—Relief is furnished at New Bedford as provided in the U. S. Public Health and Marine-Hospital Service regulations for stations of Class III (see Appendix IV). The nearest marine hospital is at Vineyard Haven.

Supplies.—Coal in unlimited quantities, water, and ship's stores may be obtained and will be put on board either at the wharves or anchorage.

Repairs.—At Fairhaven there is a marine railway by which vessels of 600 tons may be hauled out.

Storm warning displays of the U. S. Weather Bureau are made from a staff on one of the coal pockets of the Philadelphia and Reading Coal and Iron Company. An explanation of the use and meaning of these signals is given in Appendix III.

Ice.—See page 111.

Tides.—The mean rise and fall of tides is 4.2 feet (see also table on page 11).

SAILING DIRECTIONS, NEW BEDFORD HARBOR.

The following directions are good for the draft indicated, but clear weather is necessary for a stranger who should be able to see the aids when entering. The ranges (see "Ranges" in the general description preceding), when they can be seen, will be of great assistance when entering by the Eastern or Middle channels. The directions for the inner harbor are good for a draft of 17 feet; strangers of deeper draft should take a pilot, or, if in a sailing vessel they should employ a towboat. A stranger of over 14 feet draft should not attempt to enter at night, and should not go higher than the anchorage off Clark Point.

1. ***Approaching and Entering, by the Eastern Channel to Clark Point.—I. From Northward, for vessels of 20 feet or less draft.***—Coming down the bay steer **SW.**, and keep Bird Island Lighthouse bearing northward of *NE.* When Dumpling Rock Lighthouse bears **W. ½ S.** steer for it on this bearing; pass 400 yards south of black can buoy

No. 9 off West Island and the same distance south of Mosher Ledge bell buoy, and when the white tower on Clark Point bears *NNW.* ¾ *W.* follow the directions in paragraph V.

Remarks.—The **W.** ½ **S.** course leads nearly 1¼ miles southward of West Island. For dangers, see paragraph V.

II. Having come through Woods Hole.—Having followed the general directions, Great Harbor to Buzzards Bay, page 108, leave Mosher Ledge bell buoy about 200 yards on the starboard hand, and when the white tower on Clark Point bears *NNW.* ¾ *W.* follow the directions in paragraph V.

Remarks.—For dangers in the approach to New Bedford Harbor, see paragraph V.

III. Having come through Quicks Hole, for vessels of 20 feet or less draft.—From a position nearly ¼ mile *E.* of the buoy on Lone Rock steer **N.** ¾ **E.**, taking care not to be set eastward by the flood current. Having stood on this course about 5 miles, Mosher Ledge bell buoy should be ahead, and Hursell Rock buoy (spar, red and black horizontal stripes) should be on the port beam, and as it is passed should be left about ¼ mile on the port hand. When the white tower on Clark Point bears *NNW.* ¾ *W.* follow the directions in paragraph V.

Remarks.—Crossing Buzzards Bay the flood current has a general easterly set, and the ebb a general westerly set. There are no dangers until up to Hursell Rock. A small, detached, 22-foot spot lies a little over 1¼ miles **S.** by **E.** ½ **E.** from Hursell Rock buoy. See also dangers under paragraph V.

IV. From Westward, for vessels of 20 feet or less draft.—Follow the directions in section 1 B, page 112, and when Dumpling Rock Lighthouse bears *N.* by *W.* steer **NE.** heading for the south end of West Island. Leave Hursell Rock buoy (spar, red and black horizontal stripes) nearly ½ mile on the port hand, and when the white tower on Clark Point bears **NNW.** ¾ **W.** steer for it on the bearing and follow the directions in paragraph V.

Remarks.—On the **NE.** course heading for the south end of West Island, Wilkes Ledge buoy (can, red and black horizontal stripes) will be left about ⅞ mile on the port hand; Hursell Rock buoy and Mosher Ledge bell buoy will be made on the port bow, and when the former is on the port beam the white tower (disused lighthouse) on Clark Point will be nearly on the bearing. The sailing line passes well clear of all dangers.

V. When the white tower on Clark Point bears **NNW.** ¾ **W.** steer for it on this bearing, and leave Mosher Ledge bell buoy 100 yards, and Henrietta Rock buoy (spar, red and black horizontal stripes) 200 yards, on the starboard hand. When Egg Island beacon bears **N.**, and is in range with the large red building with pointed red cupola (Rogers School), steer for the beacon on this range; or, when Butler Flats Lighthouse bears **N.** ¾ **W.**, steer for it on the bearing, and anchor ½ mile *S.* of Butler Flats Lighthouse. If bound to New Bedford, follow the directions in section 2.

Remarks.—On the **NNW.** ¾ **W.** course for the white tower (disused lighthouse), deep-draft vessels must keep close on the bearing, which leads about midway between Henrietta Rock and Brooklyn Rock, the channel between these rocks being about 500 yards wide. After Henrietta Rock buoy (spar, red and black horizontal stripes) has been passed, the range of Egg Island beacon and the large red building with pointed red cupola, in Fairhaven, will be seen broad off the starboard bow.

Dangers.—**West Island Shoal** extends nearly 1 mile in a general **SSE.** direction from the south end of West Island, and for half this distance has depths of 1 to 3 feet; for the remainder of the distance the depths range from 10 to 18 feet. A buoy (can, black, No. 9) is placed off the end of the shoal, and lies nearly 1 mile **S.** by **E.** from the southeast point of West Island. There is a **small, detached ledge** with 16 feet over it ⅜ mile **W.** ¼ **N.** from this buoy. A **small, detached rock** with 18 feet over it lies nearly 1¾ miles **S.** by **W.** ¼ **W.** from the southeast point of West Island.

Hursell Rock, a small, detached rock with 16 feet over it, lies 2⅝ miles **E.** ⅛ **N.** from Dumpling Rock Lighthouse, and 3⅛ miles **S.** by **E.** ¾ **E.** from the white tower on Clark Point; it is marked on its eastern side by a buoy (spar, red and black horizontal stripes). In heavy southerly gales this buoy should be given a good berth, for depths of less than 5 fathoms, over which the sea occasionally breaks, extend ⅜ mile southward and ¼ mile westward from the rock.

Mosher Ledge is nearly ⅝ mile long in a **N.** by **E.** and **S.** by **W.** direction, with depths of 7 to 18 feet. The shoalest water is near its southern end and lies 1 mile **S.** by **W.** ¼ **W.** from Sconticut Point. Depths of less than 25 feet extend nearly ⅜ mile southward from the ledge, and a red bell buoy is placed in 26 feet of water off its southern end.

West Island Ledge is on the north side of the channel between West Island and Sconticut Point; it has a number of rocks showing bare at low water, and the depths over it range from 2 to 10 feet. A buoy (spar, red, No. 2) is placed on the southern end of the ledge.

Henrietta Rock is a small, detached rock with 11 feet over it, and lies nearly 1 mile **SW.** by **W.** ¼ **W.** from Sconticut Point. The rock is surrounded by deep water, and is marked by a buoy (spar, red and black horizontal stripes).

Brooklyn Rock, a small, detached rock with 18 feet over it, lies in the middle of the eastern channel between North Ledge and Henrietta Rock, and nearly 600 yards **WSW.** ¾ **W.** from Henrietta Rock buoy.

There is a small, detached, 18-foot spot lying nearly ¼ mile **W.** ¾ **N.** from Henrietta Rock buoy, and 400 yards eastward of the edge of North Ledge.

Packet Rock Ledge, and **Packet Rock** with a depth of 5 feet, is part of the shoal making westward from the south end of Sconticut Neck and is near the western edge of the shoal. The western edge of the shoal is marked by a buoy (spar, red, No. 6) which lies a little over ¾ mile **W.** ¾ **S.** from Sconticut Point, and ⅝ mile **N.** by **E.** ¼ **E.** from Hursell Rock buoy. There is a black spar buoy 350 yards northeastward of the red buoy, and a red spindle nearly ⅝ mile eastward of the red buoy.

Phinney Rock is a small, detached rock with 11 feet over it, lying in the middle of the entrance between the Eastern and Middle channels, and 1⅛ miles **ENE.** ⅜ **E.** from Dumpling Rock Lighthouse. The rock is marked by a buoy (spar, black, No. 1A).

North Ledge is nearly ¼ mile long in a **N.** and **S.** direction, and 450 yards wide; it lies in the middle of the entrance between the Eastern and Middle channels. and has depths of 10 to 18 feet over it. The eastern edge of this ledge is marked by two buoys, the southern (can, black, No. 3) the northern (spar, black, No. 3A).

Old Bartlemy is a rock on the edge of the shoal making eastward from Clark Point. The rock has a depth of ½ foot, and lies 400 yards **ENE.** ¾ **E.** from the white tower on Clark Point. A buoy (spar, black, No. 7) marks the edge of the shoal, and a small spindle marks the rock.

A small, detached, 18-foot spot lies ¼ mile **ESE.** ¼ **E.** from the white tower on Clark Point.

VI. At night, for vessels of 14 feet or less draft.—Having approached the entrance as directed in paragraphs I to IV, inclusive, keep Dumpling Rock Light bearing northward of **W.**, and bring Butler Flats Light to bear **N.** by **W.** ¼ **W.** When the latter light is on this bearing, Palmer Island Light will show just eastward of Butler Flats Light and barely clear of it. Keep close on this range heading for Butler Flats Light, and anchor in 28 feet of water ½ mile southward of it and a little westward of the range.

Remarks.—The range will lead 300 yards eastward of Hursell Rock buoy, and at least 250 yards westward of Henrietta Rock. For dangers, see paragraph V, preceding.

1 A. ***Approaching and Entering, by the Middle Channel.—From Hen and Chickens Light-vessel, for vessels of 20 feet or less draft.***—Following the directions in section 1 B, page 112, when on the **ENE.** ½ **E.** course standing into Buzzards Bay, Dumpling Rock Lighthouse bears *N.* ½ *E.*, distant 3 miles, steer **NE.** by **E.** so as to pass nearly ½ mile southward of the red and black horizontally striped can buoy on Wilkes Ledge. When the white beacon (Egg Island beacon) is in range with the high water tower in Fairhaven, bearing **N.** by **E.** ⅝ **E.**, stand northward keeping close on the range. Pass ¼ mile eastward of Wilkes Ledge buoy, and 50 yards westward of Great Ledge (W. part) buoy (spar, red, No. 6). When about 1 mile southward of Clark Point, open the water tower a little eastward of the beacon, and anchor ½ mile southward of Butler Flats Lighthouse; or, if of less than 17 feet draft and bound to the city, proceed as directed in section 2.

Or, proceed as directed above, and when on the **NE.** by **E.** course the white tower on Clark Point is in range with a large white house with black-topped cupola (on this range a large red building with a pointed red cupola will be seen just eastward of the white house), stand northward keeping close on the range of the tower and white house, course **N.** by **E.** ⅛ **E.** Pass over ¼ mile eastward of Wilkes Ledge buoy and 150 yards westward of Great Ledge (W. part) buoy; when the tower on Clark Point is 1½ miles distant ahead, steer

NE. ¾ **N.**; and when Butler Flats Lighthouse bears **N.**, steer for it and anchor ½ mile south of the lighthouse; or, if of less than 17 feet draft and bound to the city, follow the directions in section 2.

Remarks.—If the weather is not clear enough to see the ranges when near Wilkes Ledge, pass ¼ mile eastward of Wilkes Ledge buoy and steer **N.** by **E.** ⅛ **E.** and continue on this course until the ranges can be seen, when either of them may be steered for.

Passing Wilkes Ledge care must be taken to give the buoy a good berth. At low water a small part of Great Ledge may just show bare. When standing on the range of the white tower and the white house (Rodgers House), and Clark Point is 1½ miles distant ahead, Sconticut Point will bear **E.** ¾ **N.**

On the **NE.** ¾ **N.** course Egg Island beacon and Butler Flats Lighthouse will be on the port bow; the least water on this course should not be less than 24 feet.

Dangers.—**Wilkes Ledge** is about ⅝ mile in diameter with depths of less than 24 feet, and has a least depth of 9 feet near its northern side. The middle of the ledge lies 1¾ miles **S.** ½ **E.** from Dumpling Rock Lighthouse, and it is marked at its southern side by a buoy (can, red and black horizontal stripes).

The **Sandspit** is 600 yards long in a general **E.** and **W.** direction, is about 250 yards wide, and has 10 to 18 feet over it. The eastern end of this ledge lies ⅝ mile **SE.** ¼ **S.** from Dumpling Rock Lighthouse, and is not marked; its western end is marked by a buoy (bell, red).

Great Ledge is 600 yards in diameter with depths of less than 24 feet, and near its middle has 1 foot over it; the ledge is 400 yards in diameter, with depths of less than 18 feet, and is marked by two buoys—a black spar buoy, No. 7, on its eastern side, and a red spar buoy, No. 6, on its southwestern side.

Middle Ledge and **Inez Rock** lie on the western side of the Middle Channel about **NE.** ¾ **N.**, distant 1¼ and 1⅝ miles, respectively, from Dumpling Rock Lighthouse. They are small, detached ledges, and each is marked by a red and black horizontally striped spar buoy. Middle Ledge has a least depth of 5 feet and Inez Rock a depth of 11 feet over it.

Phinney Rock is described under section 1, preceding.

Church Rock and **Decatur Rock** are a part of two ledges on the eastern side of Middle Channel, nearly 2 miles **S.** of Clark Point. The former has a depth of 15 feet, and the latter a depth of 7 feet over it. The two ledges are close together, and extend nearly 800 yards in a general **N.** and **S.** direction with a width of 200 yards. The southern end of the ledges (Church Rock) is marked by a buoy (spar, red, No. 6A), and the northwestern end (Decatur Rock) is marked by a buoy (spar, red, No. 8).

North Ledge is described under section 1; the buoys marking the eastern side of this ledge should be given a berth of 600 yards or more when in the Middle Channel.

A **small, detached, 17-foot spot** lies a little over ¼ mile **S.** by **E.** from the white tower on Clark Point.

A **small, detached, 21-foot spot** lies ⅝ mile **SSE.** ¾ **E.** from the white tower on Clark Point.

Old Bartlemy is described under section 1.

1 B. ***Approaching and Entering by the West Channel.—I. For vessels of 20 feet or less draft.***—With Hen and Chickens Light-vessel bearing *WSW.* ½ *W.*, steer **ENE.** ½ **E.** until Dumpling Rock Lighthouse bears **NE.** by **N.**, and then steer for the lighthouse on this bearing. When the red bell buoy on the Sandspit is made, steer so as to pass about 200 yards westward and northward of it and about 600 yards southeastward of the lighthouse. When passing this buoy, shape the course **NE.** ½ **N.**, pass about 600 yards eastward of the lighthouse and Middle Ledge buoy. Continue the course until Egg Island beacon and the high water tower in Fairhaven are in range; then stand northward on this range and anchor about ½ mile south of Butler Flats Lighthouse, or follow the directions in section 2.

Dumpling Rock Lighthouse can be steered for bearing anywhere between **NE.** ¾ **N.** and **N.** ½ **E.**

Remarks.—The **NE.** by **N.** course leads about ⅝ mile eastward of the bell buoy off Mishaum Ledge, and about the same distance eastward of Salter Point Ledge buoy. Wilkes Ledge buoy will be left well on the starboard hand. **Round Hill**, the point just westward of Dumpling Rock Lighthouse, will show quite prominently. As Dumpling Rock Lighthouse is approached the bell buoy on Sandspit and the black spar buoy marking the shoals southward of the lighthouse will be seen; the sailing line leads about midway between these buoys. Egg Island beacon and Butler Flats Lighthouse will be seen just eastward of Clark Point when the vessel is abreast of Dumpling Rock Lighthouse.

On the **NE. ½ N.** course Middle Ledge buoy should be made on the port bow and be left on the port hand; Inez Rock buoy will be seen and left well on the port hand. The buoys marking Church and Decatur rocks and North Ledge will be left well on the starboard hand.

When standing on the range Clark Point will be left about ⅝ mile on the port hand.

Dangers.—The dangers until up to Wilkes Ledge are described on pages 112–113.

Salters Point Ledge is a detached ledge with 2 feet of water over it, and lies a little over 1 mile **SW. ¾ W.** from Dumpling Rock Lighthouse; it is marked on its eastern side by a buoy (spar, black, No. 5).

Sandspit and **Great Ledge** are described under section 1 A, preceding.

Dumpling Rocks have 5 to 10 feet over them, and extend southward and southwestward from the small island on which the lighthouse is situated. The eastern edge of these rocks is marked by a buoy (spar, black, No. 7).

White Rock is a small, bare rock lying a little over ½ mile **N.** by **E.** from Dumpling Rock Lighthouse. It is a prominent mark for vessels bound into Apponaganset Bay. Ragged Rocks, showing bare, and Fatal Rock, with 3 feet over it and marked by a red and black horizontally striped spar buoy, lie westward of White Rock, between it and the shore.

Middle Ledge, Inez Rock, Church Rock, and **Decatur Rock** are described on page 117, and North Ledge and Old Bartlemy on page 116.

At night, for vessels of 14 feet or less draft.—Follow the directions for entering Buzzards Bay, and when on the **ENE. ½ E.** course Dumpling Rock Light bears **NE.** by **N.**, steer for the light on this bearing, taking care to keep in its white rays. As the light is approached steer so as to leave it 600 yards on the port hand, and when the light bears *N.* by *W.* ½ *W.* the vessel should be about 200 yards northward of the bell buoy on the west end of the Sandspit. Then steer **NE. ½ N.**, and watch the bearing of Butler Flats Light; when it bears **N.** by **E. ¼ E.** steer for it on this bearing, and having stood on this course about 1 mile, haul more eastward so as to bring the light to bear **N.**; then steer for it on the latter bearing, and anchor when the light is ½ mile distant ahead.

See the remarks and dangers preceding.

2. ***From Clark Point to the Anchorage in the Inner Harbor.—For vessels of 17 feet or less draft, in the daytime.***—When ½ mile south of Butler Flats Lighthouse, bring Palmer Island Lighthouse in range with the middle of the draw in Fairhaven bridge (the right-hand one of the two highest chimneys of the Wamsutta Mills will then be seen nearly over the middle of the draw). Then bring the lighthouse in range with this chimney, and stand in on the range so as to pass eastward of Butler Flats Lighthouse and black spar buoy No. 9, which marks the edge of Butler Flats.

Continue close on the range after passing Butler Flats Lighthouse; a number of buoys will be seen ahead. Leave these buoys on the side indicated by their color, giving them a berth of about 40 yards, and when abreast of red spar buoy No. 12, or when Range beacon (high triangular pyramidal white beacon with black ball on top) bears on the starboard beam, steer about **N.** so as to leave red spar buoy No. 14 on the starboard hand and black spar buoy No. 15 on the port hand. When 250 yards above the latter buoy anchor in 23 to 26 feet of water, soft bottom.

If bound to the city wharves a towboat should be employed.

Remarks.—When on the range heading for Palmer Island Lighthouse, red spar buoy No. 10 and Egg Island beacon are left about 400 yards on the starboard hand, and when past the beacon several buoys will be seen on both bows. Before the first buoy (spar, black, No. 11) is reached, care should be taken to keep fair on the range, which will lead eastward of black spar buoys Nos. 11 and 13, and about 40 yards westward of red spar buoy No. 12. The **Range beacon** will be seen on the beach a little over ¼ mile eastward of buoy No. 12. When the course is changed northward from this buoy, it should lead about 50 yards westward of red spar buoy No. 14, and about 50 yards eastward of black buoy No. 15. The anchorage northeastward of Palmer Island Lighthouse is known as the **Deep Hole.**

Dangers.—**Butler Flats** makes off ⅝ mile from the western shore, about ⅝ mile northward of Clark Point; it has 4 to 12 feet over it and is marked at its northeastern edge by a buoy (spar, black, No. 9). Butler Flats Lighthouse is about 200 yards inside the eastern edge of the flat.

Egg Island Flat is the extensive shoal which lies on the eastern side of the channel and surrounds Egg Island beacon, extending ¾ mile southeastward from it. The shoalest part of the flat is northeastward and

eastward from the beacon. A buoy (spar, red, No. 10) is placed in 18 feet of water, about 450 yards southward of the beacon, as a guide to keep vessels off the shoal part of the flat. **Egg Island beacon** is a white granite cone with spindle and vane on top.

Shoals extend along the eastern side of the channel from Fort Point to Egg Island beacon.

Eleven-foot Bank makes off from the western shore about ½ mile southward of Palmer Island Lighthouse; it has from 7 to 11 feet over it, and is marked at its eastern edge by a buoy (spar, black, No. 11).

Palmer Island Shoal surrounds Palmer Island and extends nearly ¼ mile southward from it. The eastern edge is marked by two buoys (spars, black, Nos. 13 and 15).

Fort Flat extends southward and westward from **Fort Phoenix**, the eastern point at the entrance to the inner harbor. The western edge of the flat is marked by two buoys (spars, red, Nos. 12 and 14).

Dix Ledge has 5 feet over it and lies well over toward the eastern shore of the inner harbor, about **ENE. ½ E.** from Palmer Island Lighthouse; it is marked on its western side by a buoy (spar, red, No. 16).

Crow Island lies in the northeastern part of the harbor, about 160 yards from the upper wharves in Fairhaven. The water is shallow eastward and northeastward of the island; there is 9 to 12 feet of water southward and westward of the island.

CLARK COVE*

makes northward just west of the entrance to New Bedford Harbor; between **Clark Point**, marked by a granite fort and white tower, on the east and Moshers Point on the west the entrance is about ¾ mile wide. The cove has anchorage in 12 to 22 feet water, but is exposed to southerly winds and is seldom used; the channel is marked by several buoys. The houses and spires of the city of New Bedford can be seen at the head of the cove. The tides are the same as at New Bedford (see table, page 11).

SAILING DIRECTIONS, CLARK COVE.

The following directions are good in the daytime for a draft of 14 feet to an anchorage above Moshers Point. At night, anchor eastward of Clark Point and wait for daylight. See also the note preceding the sailing directions for New Bedford Harbor.

Approaching and entering.—Follow the directions in section 1, 1 A, or 1 B, pages 114–118, for approaching and entering New Bedford Harbor.

I. Following the directions in paragraph V, page 115.—On the **NNW. ¾ W.** course, when Henrietta Rock buoy bears abaft the starboard beam, steer **NW. ½ W.**, taking care to pass northward of black spar buoy No. 3A. After passing this buoy, Clark Point buoy (spar, red, No. 2) should be made on the starboard bow; pass southward of this buoy, and then haul northward, course about **N. ½ W.**, and pass about 100 yards westward of it. Red spar buoy No. 4 should be made on the starboard bow. Anchor anywhere on the course; the water shoals gradually toward the head of the cove.

II. Following the directions in section 1 A, page 116.—Steer for the white tower on Clark Point on the **N.** by **E. ⅛ E.** course until Ricketsons Point, the north point at the entrance to Apponaganset Bay, bears *W.* by *N.* Then steer **NNW. ¾ W.**, pass westward of red spar buoy No. 2, and anchor as directed in the preceding paragraph.

III. Following the directions in section 1 B, page 117.—In standing on the range of Egg Island beacon and the high water tower in Fairhaven when Ricketsons Point (north point at entrance to Apponaganset Bay) bears on the port beam, steer **NNW. ¾ W.**, pass about 100 yards westward of red spar buoy No. 2, and anchor as directed in paragraph I.

For **remarks** and **dangers** see those under sailing directions for New Bedford Harbor. After entering the cove there are no dangers, until near the head of the harbor, for vessels of 11 feet or less draft if the shores be given a berth of about 400 yards.

APPONAGANSET BAY*

is the bight southwestward of Clark Cove and about 2 miles northward of Dumpling Rock Lighthouse, and is the approach by water to the village of **South Dartmouth** (**Padanaram**). On the south side of the entrance is the village of **Nonquitt**. The extension of the bay above the bridge at South Dartmouth is known as Apponaganset River, into which several small streams flow.

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*See footnote on page 113.

Apponaganset Bay is sometimes called **Padanaram Harbor.** It is shallow and of but little importance, the depth above the entrance ranging from 7 to 12 feet; small coasting vessels occasionally enter with cargoes of coal and building material for local use, and small yachts sometimes anchor here during the summer, but the anchorage is insecure in southeasterly storms. A breakwater is being built, extending southward from the shoal at Ricketsons Point; at present (1903) the southern end of the breakwater is 1,025 feet **S.** by **W.** ¾ **W.** from the point. The approach to the bay is obstructed by numerous ledges and rocks, some of which are described under the heading, New Bedford Harbor. A stranger should not attempt to enter except in the daytime with clear weather.

The mean rise and fall of tides is about the same as in New Bedford Harbor (see table, page 11).

SAILING DIRECTIONS, APPONAGANSET BAY.

The following directions are good for a draft of 12 feet or less, in the daytime when the aids can be seen, and lead to an anchorage inside the breakwater.

1. ***Approaching and Entering, from Eastward.***—Coming down Buzzards Bay follow the directions in paragraph 1, page 114, and when ¼ mile south of West Island Shoal buoy (can, black, No. 9) steer **W.** ¼ **N.**; leave Mosher Ledge bell buoy close-to on the starboard hand, and pass about 350 yards north of Phinney Rock buoy, and ¼ mile south of Church Rock and Middle Ledge buoys.

When Dumpling Rock Lighthouse bears *SW.* steer **NW.** by **N.**, fair for the middle of the entrance to Apponaganset Bay. Leave Middle Ledge and Lone Rock buoys about 450 yards on the starboard hand, and Hussey Rock buoy 500 yards on the port hand, and enter Apponaganset Bay passing south of the end of the breakwater off Ricketsons Point. Dartmouth Rock buoy, in Apponaganset Bay, will be made on the starboard bow. Anchor in 14 feet of water, soft bottom, about 200 yards westward or northwestward of Dartmouth Rock buoy.

Remarks.—On the **W.** ¼ **N.** course, Mosher Ledge bell buoy (red) will be made ahead, and Dumpling Rock Lighthouse will be on the port bow.

On the **NW.** by **N.** course, the southern end of the breakwater off Ricketsons Point will be a little on the starboard bow.

Dangers.—The principal dangers, **Hursell Rock, Phinney Rock, Church Rock,** and **Middle Ledge,** are described under the sailing directions for New Bedford Harbor, pages 115, 116, and 117.

White Rock and **Ragged Rocks** lie about ¼ mile offshore and about the same distance north of Dumpling Rock Lighthouse and are always bare and easily seen. Several other rocks lie close in to the western shore. The sailing lines lead well clear of all of these.

Fatal Rock, with 3 feet over it, lies ¼ mile **N.** by **W.** ¼ **W.** from Dumpling Rock Lighthouse. The rock is marked on its north side by a buoy (spar, red and black horizontal stripes).

Hussey Rock, with 4 feet over it, is nearly ⅝ mile offshore, and a little over 1 mile **N.** ¾ **E.** from Dumpling Rock Lighthouse, and is marked by a buoy (spar, black, No. 1).

Lone Rock, with 2 feet over it, and marked by a buoy (spar, red and black horizontal stripes) lies 1⅝ miles **NNE.** ¼ **E.** from Dumpling Rock Lighthouse.

1 A. ***Approaching and Entering, from Westward.***—Follow the directions in section 1 B, page 117, until Dumpling Rock Lighthouse bears *W.*, distant about ⅝ mile. Then steer **N.**, passing about 400 yards eastward of White Rock, and the same distance eastward of Hussey Rock buoy (spar, black, No. 1). When this buoy bears four points abaft the port beam, steer **NW.** by **N.** into the harbor; pass south of the breakwater off Ricketsons Point and anchor as directed in section 1, preceding.

Remarks and dangers.—See under section 1, foregoing. **White Rock** is the easternmost of the bare rocks lying about ¼ mile northward of Dumpling Rock Lighthouse.

MATTAPOISETT HARBOR*

lies about 4 miles northeastward of New Bedford Harbor, and is marked on its north side by **Ned Point Lighthouse** (see table, page 18). The entrance, between **Angelica** and **Strawberry points** on the east, and **Mattapoisett Neck** on the west, is about 1¼ miles wide, but is much obstructed by shoals and ledges, between which a buoyed channel leads to the anchorage off the village of **Mattapoisett**, which is situated on the north shore about ¾ mile above Ned Point. The harbor is exposed to southeasterly winds, but the ledges at the entrance somewhat break the sea from that direction. It is little frequented except by yachts. The carrying trade of Mattapoisett is comprised in a few cargoes of coal and building material for local use. The least depth in the channel as far as the anchorage off the village is 14 feet at mean low water. A draft of 8 feet may be taken to the wharves and 14 feet to the anchorage off Ned Point.

Pilots are not usually taken, but one may be had by signaling when off the entrance, anchoring if necessary until one comes from the shore. Pilotage is compulsory only for certain vessels. See pilotage laws in Appendix II.

Tides.—The mean rise and fall of tides is 3.9 feet.

SAILING DIRECTIONS, MATTAPOISETT HARBOR.

The following directions lead to an anchorage in 15 feet westward of Ned Point. Anchorage in 10 to 13 feet will be found off the wharves of the town. Strangers should not attempt to enter at night.

1. ***Approaching and Entering, from Woods Hole or from Quicks Hole.***—Having come through Woods Hole, when black buoy No. 5 at the western side of the entrance to Woods Hole bears *W.*, distant about 200 yards, steer **N.** by **W.** ½ **W.** about 5½ miles; Ned Point Lighthouse should then be seen bearing about *NNW.* and the buoy (can, black) on Nyes Ledge should be about ¾ mile distant and just open to the left of the lighthouse. Steer for Ned Point Lighthouse, keeping it bearing **NNW.**; leave Nyes Ledge buoy, Mattapoisett Ledge buoy, and Gallatin Rock buoy 300 to 400 yards on the port hand, and when the latter buoy is on the port beam haul more westward, course about **NW.** by **W.** Pass southward of Snow Rock buoy, and about 300 yards north of Sunken Ledge buoy, and when the latter buoy is abeam steer about **NNW.** and anchor when Ned Point Lighthouse bears **E.**

To anchor off the town, continue the **NNW.** course and anchor southward of the wharves, giving them a berth of 300 yards.

Having come through Quicks Hole.—When eastward of Lone Rock buoy steer **NE.** ¾ **N.** about 9¾ miles with Bird Island Lighthouse ahead. When Ned Point Lighthouse bears **NNW.**, steer for it on that bearing and follow the directions above.

Remarks.—On the **NNW.** course for Ned Point Lighthouse, the buoys marking the channel will be on the port hand.

On the **NW.** by **W.** course Snow Rock buoy (spar, red, No. 4) should be on the starboard bow and Sunken Ledge buoy on the port bow; a low point with a small wharf and clump of trees upon it will be seen ahead.

On the **NNW.** course for the anchorage, a white church spire will be a little on the starboard bow, and Barstow Rock buoy should be left about 250 yards on the starboard hand. The lead should be used when standing to the anchorage; the water shoals gradually toward the wharf at the head of the harbor.

Dangers.—**Nyes Ledge** is a large, detached ledge, with a least depth of 7 feet over it, lying nearly 1¼ miles southeastward of Mattapoisett Neck, and is marked off its eastern end by a buoy (can, black). The ledge can be avoided by keeping Bird Island Lighthouse bearing northward of **NE.** until Ned Point Lighthouse bears westward of **NNW.** There is a narrow channel westward of this ledge, but strangers should not attempt it.

Mattapoisett Ledge extends nearly 1 mile southeastward from Mattapoisett Neck, has a depth of 1 foot nearly ⅛ mile from the shore, and is marked at its eastern end by a buoy (spar, black, No. 1).

*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$; **252**, scale $\frac{1}{20,000}$; price of each $0.50.

Gallatin Rock, a detached rock with 10 feet over it, lies on the western side of the entrance, about 1⅛ miles **S.** ⅝ **E.** from Ned Point Lighthouse, and is marked off its eastern side by a buoy (spar, black, No. 3).

Sunken Ledge has 3 feet over it, lies ¼ mile from the western shore and **S.** by **W.** ¼ **W.** from Ned Point Lighthouse, and is marked off its eastern side by a buoy (spar, black, No. 5).

Snow Rock, with a least depth of 5 feet over it, lies on the eastern side of the channel, nearly ¾ mile **S.** ¼ **E.** from Ned Point Lighthouse, and is marked by a buoy (spar, red, No. 4).

Barstow Rock, a detached rock with 8 feet over it, lies a little over ¼ mile **S.** ½ **W.** from Ned Point Lighthouse, and is marked by a buoy (spar, red and black horizontal stripes) placed off its southern end.

Ned Point Shoal makes off about 400 yards southeastward from the point and is marked by a buoy (spar, red, No. 6) off its end.

Landing Rock, with 3 feet over it, lies about 100 yards from the wharf on the northern shore of the harbor, and about ¾ mile **NW.** ¾ **W.** from Ned Point Lighthouse, and is marked by a buoy (spar, red, No. 8).

1 A. ***Approaching and Entering, from Hen and Chickens Light-vessel.***—Follow the directions in section 1 B, page 112, and on the **ENE.** ½ **E.** course from the light-vessel, when Dumpling Rock Lighthouse bears *NNW.* steer **NE.** by **E.** about 5¼ miles, passing about ⅜ mile southward of West Island Shoal buoy (can, black, No. 9). When the south end of Sconticut Point is in range with the white tower on Clark Point, bearing *NW.* by *W.* ½ *W.*, steer **NE.** so as to pass about ⅜ mile southward of Nyes Ledge buoy. When Ned Point Lighthouse bears **NNW.** steer for it and follow the directions in section 1, preceding.

Remarks.—The remarks and dangers up to West Island Shoal are given under section 1 B, page 112.

When on the **NE.** course care should be taken to keep Bird Island Lighthouse bearing a little northward of **NE.** until Ned Point Lighthouse comes on the **NNW.** bearing; this will clear Cormorant Rock and Nyes Ledge, the two most prominent dangers off the western shore between New Bedford entrance and Mattapoisett Harbor.

Dangers.—**Cormorant Rock**, which shows bare at half tide and is marked by a spindle (black, with cage on top), lies 1⅞ miles **NE.** by **E.** ⅛ **E.** from the southern point of West Island and 2¾ miles **S.** ¾ **W.** from Ned Point Lighthouse. Shoal water extends a little over ¼ mile southward of the spindle, and about 200 yards eastward of it, and a 14-foot spot lies nearly ¼ mile **NE.** by **E.** ¼ **E.** from the spindle. There is a channel between the rock and Ram Island off Mattapoisett Neck, but strangers should not attempt it.

Nyes Ledge and the dangers in Mattapoisett Harbor are described on pages 121–122.

SIPPICAN (MARION) HARBOR*

makes into the north shore of Buzzards Bay about 2¼ miles northeastward from Mattapoisett entrance, and is marked by **Bird Island Lighthouse** (see table, page 18), which is on a small, low island ⅜ mile southward of the eastern point at the entrance to the harbor. The entrance between **Sippican Neck** on the east and **Charles Neck** on the west is about 1⅛ miles wide, and has few dangers. Above the entrance the width of the harbor gradually lessens, and at **Ram Island**, 2¼ miles above Bird Island Lighthouse, the width between the island and western shore is only 300 yards. The harbor is seldom used as an anchorage except by yachts; it is entered by a few vessels each year with cargoes of coal and lumber. The town of **Marion** is on the west shore, about 2½ miles above Bird Island Lighthouse.

The depth of water in the channel to Nyes Wharf, abreast Ram Island, is 12 feet, and to the anchorage off the town 7 feet at mean low water. About 9 feet can be taken to the head of navigation, on high tides. The greatest draft entering the harbor is about 10 feet.

Pilots are generally taken by strangers bound up to the town; they may be had by signaling at the entrance, westward of Bird Island. If necessary vessels may anchor in the entrance of the harbor until boarded by a pilot. Pilotage is not compulsory for coasting vessels (see Appendix II).

Towboats are seldom used; one may be had by telegraphing to New Bedford.

Tides.—The mean rise and fall of tides is 3.9 feet. See also table on page 11.

Ice.—The harbor is usually closed to navigation for a month or more each winter. See page 111.

*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50; **349**, scale $\frac{1}{20,000}$, price $0.20.

GENERAL DIRECTIONS, SIPPICAN HARBOR.

The following directions are good for vessels of 12 feet or less draft to an anchorage in 14 feet about 1½ miles above Bird Island Lighthouse, and are good for vessels of less than 7 feet draft to the anchorage off the town of Marion. Some local knowledge is necessary to keep vessels in the best water up to the town; strangers should not attempt to enter at night.

Approaching and Entering.—Follow the directions for Buzzards Bay, pages 112–113, and when abreast Mattapoisett Harbor haul more northward and steer for Bird Island Lighthouse on any bearing northward of **NE.** Bring Bird Island Lighthouse to bear *NE.*, distant 1 mile, and steer **N.** so as to leave the lighthouse about ¾ mile on the starboard hand and the western point at the entrance about ⅝ mile on the port hand. When Bird Island Lighthouse bears *SE.*, steer **N.** by **W.** ¾ **W.**, pass about 100 yards eastward of Seal Rocks buoy (spar, black, No. 1), and anchor about ¼ mile northward or northeastward of the buoy in 15 feet, soft bottom.

Vessels of less than 7 feet draft bound to the town.—When 100 yards eastward of Seal Rocks buoy, continue the **N.** by **W.** ¾ **W.** course, heading for Little Island, a low, rocky islet close to the western shore of the harbor, and so as to pass close eastward of Black Rock buoy (spar, black, No. 3). From black buoy No. 3 steer so as to leave red spar buoy No. 4 about 10 yards on the starboard hand. From this buoy steer about **N.** so as to leave Little Island about 50 yards on the port hand, and anchor off the town eastward of black buoy No. 5.

Remarks and dangers.—When approaching the entrance, care should be taken to avoid **The Bow Bells,** with 11 feet over it, which is marked by a buoy (spar, black, No. 11) nearly 1½ miles **SW.** by **W.** from Bird Island Lighthouse, and should be left on the port hand. The large summer houses and stone wharf near the southern end of Charles Neck are conspicuous when entering.

On the **NE.** course Centerboard Shoal buoy should be left about ¼ mile on the starboard hand, and Seal Rocks buoy (spar, black, No. 1) should be on the port bow.

Centerboard Shoal, a small, detached, 12-foot spot, lies ¼ mile **SW.** ¾ **W.** from Bird Island Lighthouse, and is marked off its southern end by a buoy (spar, red, No. 2).

Charles Neck, on its southern and eastern sides, should be given a berth of ¼ mile. Seal Rocks, on the eastern side of Charles Neck, extend about 400 yards from shore, and are largely bare at low water. A buoy (spar, black, No. 1) marks the eastern edge of the shoals which lie outside the rocks.

On the **N.** by **W.** ¾ **W.** course, **Ram Island,** high and wooded, will be on the starboard bow; and black spar buoy No. 3, westward of the island, should be nearly ahead. Passing eastward of this buoy, **Little Island,** a small, rocky islet with a cluster of bushes on it, and lying about 100 yards from the western shore, should be ahead; and red spar buoy No. 4 should be a little on the starboard bow. The channel abreast Ram Island is narrow, and has a number of dangers, some of which are sometimes marked by small spar buoys placed by local parties. These dangers can be avoided by closely following the directions or by studying the chart. The currents sometimes have considerable velocity in this part of the channel.

When passing eastward of Little Island, two black buoys will be seen to the northward. The anchorage is eastward of the lower buoy, taking care to avoid a small, detached rock, with 9 feet over it, lying 200 yards **NNE.** ¼ **E.** from the northeastern end of Little Island.

WAREHAM RIVER*

empties into the northwestern end of Buzzards Bay, the entrance lying 3½ miles northward of Bird Island Lighthouse and 3½ miles **NW.** by **N.** from Wings Neck Lighthouse. The river is the approach to the town of Wareham, situated on the west bank at the head of navigation, nearly 2 miles above its mouth. Off the entrance and in the river are extensive shoals and numerous ledges, through which a narrow, buoyed channel, with a depth of 10 feet, leads from the deep water of the bay to the wharves of the town. There is no anchorage in the river except in the channel, but vessels waiting for a fair wind or tide usually anchor off the mouth of the river northeastward of Great Hill.

The town of **Wareham** has extensive iron manufactories. The deepest-draft vessels trading here are about 12 feet. There is from 5 to 10 feet of water at the wharves.

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* Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50.

Pilots are necessary for vessels of over 9 feet draft, and should be taken by all strangers. They may be obtained by making signal when off Bird Island Lighthouse or at anchor off Great Hill. Pilotage is not compulsory for coasting vessels.

Towboats are usually employed by the larger vessels, especially in winter. They may be ordered from New Bedford by telegraph or telephone at Wareham.

Supplies.—Coal, water, and provisions can be had at Wareham.

Tides.—The mean rise and fall of tides is 4.1 feet. See also table on page 11.

Tidal currents.—The velocity of the currents is not great enough to materially interfere with a vessel having a good breeze. During the first half of the ebb the current sets across the flats below the wharves of the town, westward of the channel; and during the whole of the ebb it sets across the flats below **Long Beach**, at the mouth of the river, eastward of the channel.

Ice.—The river is closed part of each winter by ice. See also page 111.

SAILING DIRECTIONS, WAREHAM RIVER.

The following directions lead to the anchorage off Great Hill, above which no stranger should go without a pilot.

Approaching and to an Anchorage off Great Hill.—Follow the directions for Buzzards Bay, pages 112 113; when Bird Island Lighthouse is made, steer so as to pass ¾ mile eastward of it, and when the lighthouse bears *WNW.*, distant about ¾ mile, steer **N. ¼ E.**, keeping the eastern end of Great Hill on the port bow. Pass about 300 yards eastward of the northeastern end of Great Hill, and anchor about 400 yards eastward of the wharf on the northeastern side of Great Hill, in 15 feet of water, soft bottom.

Remarks.—On the **N. ¼ E.** course, Bird Island Reef buoy should be left ¼ mile on the port hand, and the eastern shore of Sippican Neck should be given a berth of ½ mile; **Great Hill**, a high, wooded headland with a cleared space and large hotel on its northeastern end, should be kept on the port bow. A black buoy off the southeastern end of Great Hill will be left well on the port hand, and the eastern shore of Great Hill should be given a berth of at least 250 yards.

Dangers.—**Bird Island Reef** extends about ½ mile eastward from Bird Island, and is part of the shoal making southeastward and eastward from Sippican Neck. It has depths of 4 to 6 feet over it for a distance of over ¼ mile from the island, and is marked off its eastern side by a buoy (spar, black, No. 13).

Dry Ledge, bare at half tide, lies 1 mile **E.** by **S.** from **Great Hill Point**, the southeastern point of Great Hill. The southern end of the ledge is marked by a buoy (spar, red, No. 12), which lies about 1⅛ miles **NW. ¾ N.** from Wings Neck Lighthouse. The depths north of the ledge, to Little Bird Island, range from 4 to 9 feet.

Wings Cove Flats extend southward from Great Hill Point, the southeastern point of Great Hill, and are marked off their end by a buoy (spar, black, No. 15).

Great Flats is an extensive shoal extending southward from the eastern side of the entrance to Wareham River. The southern end of this shoal is about 150 yards northeastward of the wharf on the northeastern end of Great Hill, and is marked by a buoy (spar, red, No. 14).

BACK RIVER, ONSET BAY, MONUMENT RIVER, COHASSET NARROWS, AND BUTTERMILK BAY *

are unimportant waters at the northeastern end of Buzzards Bay, the common entrance to which lies between **Wenaumet (Wings) Neck**, on the south, and **Great Neck**, marked by **Tempes Nob** (high and prominent hill), on the north. The indentation, of which the above-named waters are a part, is very irregular in outline, and includes a large number of bights, coves, and shallow streams, whose channels are all more or less obstructed by shoals and rocks.

There are two narrow and crooked channels after passing the common entrance, the dangers of which are nearly all buoyed. The western channel leads with a least depth of 12 feet to an anchorage in Onset Bay. The eastern channel leads past Monument Beach and Back River to the entrance to Cohasset Narrows, which in turn leads to Buttermilk Bay. The least depth in the channel to Back River entrance is 11 feet, and to Cohasset Narrows 6 feet.

There is very little trade by water to any of the villages on these waters, and few vessels enter them. A stranger should not attempt to enter without a pilot.

* See footnote on page 123.

POCASSET HARBOR AND RED BROOK HARBOR.*

These two small, unimportant harbors lie southeastward of **Wenaumet (Wings) Neck**, and northeastward of **Scraggy Neck**, and their common approach is between the two. **Bassetts Island**, low, narrow, and of very irregular shape, separates the two harbors, Pocasset Harbor lying northward and westward of this island, and Red Brook Harbor southeastward.

Pocasset Harbor is entered through a narrow, buoyed passage northward of the western end of Bassetts Island. About 12 feet can be taken into the harbor.

Red Brook Harbor is very shallow, having 3 to 8 feet of water, and is entered around either the southern or the northern end of Bassetts Island. A draft of 6 feet can be taken into the harbor.

The village of **North Pocasset** lies near the eastern end of Pocasset Harbor, and the village of **South Pocasset** near the southeastern extremity of Red Brook Harbor.

Pilots are not necessary for small vessels making an anchorage in Pocasset Harbor. If desiring a pilot, one may be had by making signal when off Wings Neck Lighthouse, or after anchoring between Wenaumet Neck and Scraggy Neck.

Tides.—The mean rise and fall of tides is 4.1 feet.

GENERAL DIRECTIONS, TO ENTRANCE OF POCASSET HARBOR.

The following directions are good for vessels of not more than 14 feet draft to the anchorage south of Wenaumet Neck, where there is good holding ground in 15 to 26 feet of water.

Approaching and Entering.—Follow the directions for Buzzards Bay, pages 112–113, and when Wings Neck Lighthouse bears **NE.** by **E.** steer for it. When the lighthouse is ¾ mile distant ahead, steer **E.** ½ **N.** and anchor when it bears about *NW.*

Remarks.—When heading for Wings Neck Lighthouse on the **NE.** by **E.** course, Southwest Ledge (north part) buoy should be left ¼ mile on the starboard hand. On the **E.** ½ **N.** course the lighthouse should be left over ¼ mile on the port hand. A vessel should not approach the northern shore closer than 400 yards, and should not stand eastward of a line drawn from the west end of Scraggy Neck to the entrance of Pocasset Harbor.

Dangers.—**Southwest Ledge** lies about ⅝ mile westward of **Scraggy Neck**; it is about ¾ mile long in a general **N.** and **S.** direction, and is awash in one place at low water, near its northern end. The southwestern part of the ledge, which lies a little over 1¼ miles **SSW.** from Wings Neck Lighthouse, and the northwestern end, lying about ⅞ mile **SW.** by **S.** from the lighthouse, are marked by buoys (spars, red, Nos. 8 and 10, respectively). The passage between Scraggy Neck and the ledge is unsafe for a stranger.

Shoals and **detached spots**, with 17 to 18 feet over them, extend from the end of Wenaumet Neck to Southwest Ledge. **Spots** with 10 and 12 feet over them lie about ¼ mile **SW.** from the northwestern end of Bassetts Island. The eastern part of the harbor, between Bassetts Island and Scraggy Neck, is shoal.

CATAUMET HARBOR, WILD HARBOR, HOG ISLAND HARBOR, AND QUAMQUISSET HARBOR.*

These are all small and unimportant harbors on the eastern side of Buzzards Bay, and have but a little trade.

Cataumet Harbor is south of Scraggy Neck and has its entrance about 1¾ miles **S.** by **E.** from Wings Neck Lighthouse. The channel into the harbor is buoyed, and a draft of 9 feet can be taken well into the harbor to an anchorage in 15 to 19 feet of water. A narrow crooked channel with a depth of 8 feet leads to the village of Megansett.

Wild Harbor, a small cove about ½ mile southward of the entrance to Cataumet Harbor, has a depth of about 15 feet, and affords anchorage during northerly or easterly winds just inside the entrance. It may be entered without danger by keeping about midway between its northern and southern points of entrance.

Hog Island Harbor, 2 miles **S.** of Wild Harbor, has a depth of 3 feet in its entrance, is not buoyed, and strangers should not attempt to enter it.

Quamquisset Harbor, a very small harbor lying about 1 mile northeastward from the northern entrance to Woods Hole, is small and has a narrow, crooked channel. There is about 9 feet of water in the channel, and an anchorage depth of 12 to 18 feet inside; although the most important dangers are buoyed, a stranger should not attempt to enter.

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*See footnote on page 123.

CUTTYHUNK HARBOR*

is in the south side of Buzzards Bay, near the western entrance, and is formed by a bight between the eastern end of Cuttyhunk and western end of Nashawena Island. It is about ¾ mile wide, and affords anchorage in 12 to 24 feet water, but is exposed to northeasterly winds. Northward of the harbor are **Penikese** and **Gull** islands and a number of ledges, which shelter it from that direction. The shores on both sides of the harbor are foul, and the anchorage is in the middle; it is sometimes used by weather-bound coasting vessels and fishermen. The principal dangers are marked by buoys, and the approach from the westward is marked by **Cuttyhunk Lighthouse** (see table, page 18), which is near the western end of the island. Canapitsit Channel, the dredged cut between Nashawena and Cuttyhunk islands, has a depth of 6 feet, and is marked by several buoys.

SAILING DIRECTIONS, CUTTYHUNK HARBOR.

Strangers should not enter except in the daytime with clear weather and a fair wind. If entering from westward a greater draft than 15 feet should not be taken in.

1. ***Approaching and Entering, from Eastward.***—When westward of Quicks Hole and Lone Rock, steer **W.** by **S.** for the northern end of Cuttyhunk Island, giving the northern shore of Nashawena Island a berth of about ½ mile. When the east end of Gull Island is on the starboard beam, steer **SW.** by **W.**, heading for red spar buoy No. 6 and passing 300 yards south of black spar buoy No. 5. When red spar buoy No. 6 is ¼ mile distant ahead, anchor in the middle of the harbor eastward of the buoy. Or, if of less than 9 feet draft, steer about **S.** and anchor a little over ¼ mile from the shore in 16 feet water.

Remarks.—When approaching from eastward, Penikese and Gull islands should be on the starboard bow; care should be taken to avoid Lone Rock, which lies about ⅜ mile northward from the northeastern end of Nashawena Island. Black spar buoy No. 5 marks the southern end of a rocky ledge making southward from Gull Island. The eastern point at the entrance and the eastern shore of the harbor should be given a berth of over 300 yards. Several buoys will be seen over toward the western shore of the harbor. The best anchorage is eastward of the southernmost red buoy.

1 A. ***Approaching and Entering, from Westward.***—Steer for Cuttyhunk Lighthouse, bearing between **E.** ¾ **N.** and **SE.**, and pass about ½ mile northward of it. When the lighthouse bears *S.*, distant ½ mile, steer **NE.** by **E.** ¼ **E.** for black spar buoy No. 1, which should be made ahead. Leave this buoy about 30 yards on the port hand and steer about **E.** ¼ **S.**, heading for black spar buoy No. 3. Leave the red and black horizontally striped spar buoy marking Middle Ledge on the starboard hand, and when it is passed haul a little southward so as to leave black spar buoy No. 3 about 100 yards on the port hand. When this buoy is 150 yards abaft the port beam steer about **S.**, heading for the entrance to Canapitsit Channel, and leave the buoys on the western side of the harbor well on the starboard hand. Anchor eastward of the southernmost red buoy in 14 to 19 feet water, soft bottom.

Remarks.—In approaching Cuttyhunk Lighthouse between the bearings given, Sow and Pigs Reef is left on the starboard hand and Ribbon Reef on the port hand. On the **NE.** by **E.** ¼ **E.** course the eastern end of Penikese Island will be on the port bow, and the northeastern end of Cuttyhunk Island will be given a berth of over ¼ mile. Care should be taken not to mistake the buoys, which are rather close together; black spar buoy No. 1 should appear as the farthest northward.

On the **E.** ¼ **S.** course for black spar buoy No. 3, another black spar buoy (No. 5) will be seen about ⅜ mile farther eastward. The buoys marking detached rocks and ledges will be seen southward; when standing southward for the anchorage these should be left well on the starboard hand.

Dangers.—**Sow and Pigs** and **Ribbon Reef** are described on pages 112–113.

Shoal water extends from Penikese Island to Gull Island, and no attempt should be made to pass between them.

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*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$; price of each $0.50; **297**, scale $\frac{1}{10,000}$, price $0.25.

Shoals extend out about ½ mile northeastward from Cuttyhunk Island, **Whale Rock** and **Pease Ledge** being the names given to the parts which show at low water. A detailed description of the dangers would be of but little use; vessels must be guided mainly by the buoys.

WESTPORT HARBOR*

is the name given to the small anchorage just inside the mouth of **Westport River**, which empties into the northern part of the large bight between Gooseberry Neck and Sakonnet Point. The entrance is about 4½ miles **NNW. ¾ W.** from Hen and Chickens Light-vessel and **ENE.** from the dry rocks southward of Sakonnet Point.

Westport River has a narrow and crooked channel, with a depth of 7 feet on the outer bar and 5 feet on the inner bar below the village of **Westport Point**, which is about 1½ miles above its mouth, on the point of land between the two branches. The channel is well marked by buoys, but is too narrow and crooked to be followed, except with local knowledge. In southerly gales a heavy sea breaks on the bar at the entrance, making it unsafe to enter the harbor. About 1 mile above its mouth Westport River divides into two branches, East Branch and West Branch, which have narrow and shallow channels and are only navigated by small vessels.

About 6½ feet can be taken into the entrance of the harbor at low water, and 9 feet is the deepest draft that can be taken to the village at high water. There is 10 feet of water alongside some of the wharves.

Strangers entering the harbor take a pilot, lying off and on eastward of Two Mile Rock with signal set until boarded by one. Vessels should not attempt to enter at night. On the western side of the entrance is a peculiar, rounded nubble, about 30 feet high, on which a flagstaff is erected, which serves as a guide to the entrance.

Tides.—The mean rise and fall of tides is 3.1 feet.

The **tidal currents** set in and out of the entrance with considerable velocity, and should be allowed for.

SAILING DIRECTIONS, TO THE ENTRANCE OF WESTPORT HARBOR.

The following directions lead to the entrance of Westport River, where a pilot should be taken.

1. ***Approaching from Eastward.***—Bring Hen and Chickens Light-vessel to bear *E.* by *S.*, distant about 1 mile, and steer **N.** by **W.** ¼ **W.** Leave Lumber Rocks buoy (spar, red, No. 2) about ⅜ mile on the starboard hand, and Two Mile Rock buoy (spar, black, No. 1) and spindle (black, with spherical cage on top) about ¼ mile on the port hand. Continue this course until the flagstaff on The Nubble, at the western side of the entrance, bears about *NW.*, and anchor in about 4¾ fathoms until a pilot is obtained.

From Vineyard Sound Light-vessel steer **N.** by **W.** ⅛ **W.**; pass about 1 mile westward of Hen and Chickens Light-vessel and follow the directions above.

Remarks.—The bight eastward and northeastward of Two Mile Rock spindle is free from dangers, and the shore can be approached as close as 400 yards, but the western side of Gooseberry Neck is foul, and should be given a berth of over ½ mile. Close attention should be given the buoys, which are the best guides for a stranger.

Dangers.—There are numerous rocks and shoals around Gooseberry Neck and along the shore from Westport entrance to Sakonnet Point, and only the most important are described.

Hen and Chickens and **Old Cock** are described on page 112.

Lumber Rock, with 5 feet of water over it, lies nearly ⅜ mile **SW. ¾ W.** from the southern end of Gooseberry Neck, and is marked by a buoy (spar, red, No. 2) on its southern side. Shoal water extends from this rock to Gooseberry Neck, and ¼ mile northward to Browing Ledge, which has 6 feet of water over it.

Two Mile Rock lies a little over 1 mile **SSE.** from The Nubble, and is marked by an iron spindle (black, 35 feet high, spherical cage on top) and a buoy (spar, black, No. 1), 400 yards southward of the spindle.

Joe Burris Ledge, with 13 to 17 feet over it, lies about midway between Half Mile Rock and Two Mile Rock.

Half Mile Rock is a bare rock lying close southward of the channel into Westport Harbor.

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*Shown on chart **113**, scale $\frac{1}{80,000}$, price $0.50.

1 A. *Approaching from Westward.*—Passing about 1 mile *S.* of Sakonnet Lighthouse and ¼ mile *S.* of Schuyler Ledge buoy (spar, red, No. 2), steer **ENE.** ⅝ **E.** about 6½ miles. Leave Elisha Ledge buoy (can, red and black horizontal stripes) ⅜ mile on the starboard hand, and pass ¼ mile southward of Two Mile Rock buoy (spar, black, No. 1). When this buoy is well abaft the port beam, steer **N.** so as to pass about 400 yards eastward of the buoy and the spindle northward of it. Continue the **N.** course until the flagstaff on The Nubble bears about *NW.*, and anchor until boarded by a pilot.

Remarks.—The bight northward of the sailing line has many unmarked dangers and vessels should not stand northward until the buoy on Two Mile Rock has been passed.

On the **ENE.** ⅝ **E.** course the opening between Gooseberry Neck and Horse Neck Beach will be a very little on the starboard bow. See also the remarks under section 1, preceding.

Dangers.—**Two Mile Ledge** extends, from the western side of Westport entrance, 1 mile in a southerly direction. It is about 200 yards wide, has a spot with only 3 feet of water over it near its southern end, and 6 to 10 feet northward of this spot; there are 6 to 7 fathoms of water on its western side, and 4½ to 5½ fathoms on its eastern side. Several spots with 8 to 9 feet lie between the ledge and Two Mile Rock.

Palmer Ledge, Briggs Ledge, and **Churches Ledge** lie from ¼ to 1¾ miles westward of Two Mile Ledge, and the shore should in this vicinity be given a berth of 1¼ miles. Farther westward the shore may be approached as close as ½ mile, being careful to avoid **Elisha Ledge** and **Schuyler Ledge,** which lie farther offshore and are described in connection with the sailing directions for approaching Sakonnet River.

SAKONNET RIVER*

is the name given to the body of water which leads northward between the mainland on the east and Rhode Island on the west. It is about 12 miles long and forms an approach from the sea to Mount Hope Bay, and from it to points in the northern part of Narragansett Bay. The entrance, which is marked by **Sakonnet Lighthouse** (see table, page 18) on its eastern side, is 18 miles **NW.** by **W.** ¼ **W.** from Gay Head and 13½ miles **ENE.** ¼ **E.** from Point Judith; between Sakonnet Point on the east and Sachuest Neck on the west it is about 2¼ miles wide and has comparatively few dangers. Above the entrance its width gradually diminishes for 5 miles until up to **Fogland Point,** where it is about ¾ mile; above the point for a distance of 3½ miles the width is 1¼ miles; it then contracts to a width of ¼ mile and is crossed by a stone bridge having a draw 40 feet wide. Nearly ¾ mile above this bridge is a railroad bridge with a draw 100 feet wide. Between these two bridges is a kind of basin in which the water level differs from the level outside as much as 2 feet at certain stages of the tide, causing dangerous currents through the draws of the bridges. Vessels passing through these draws usually do so at or near the time of slack water at the bridges.

The river is little used except by fishing steamers, and small vessels carrying coal and general freight to **Tiverton Four Corners** and **Tiverton,** two villages in Tiverton township on the eastern shore, about 7 and 10 miles, respectively, above Sakonnet Lighthouse. On the northeast end of Rhode Island, a short distance north of the railroad bridge, is a large fish-oil factory, and a marine railway for the use of fishing steamers. The vessels trading to Tiverton usually enter the river from Mount Hope Bay. In summer a small steamer makes trips from Providence to Sakonnet Point, stopping at intermediate landings.

The least depth in the channel is 13 feet, found at the draw of the stone bridge. The channel for a distance of 7½ miles above Sakonnet Point is good for a least depth of 20 feet and has few unmarked dangers; about ¾ mile above Fogland Point it contracts in width, leading between extensive shoals up to the first bridge, the depth ranging from 3½ to 9 fathoms. Between the bridges the depth ranges from 5 to 10 fathoms and there are no dangers if a mid-river course is kept. Above the second (railroad) bridge 4 fathoms can be carried into Mount Hope Bay.

Anchorages.—There is good anchorage in 3½ to 4½ fathoms water just below **High Hill Point,** about 5 miles above Sakonnet Lighthouse, and in northerly winds it is easier of access than Newport for vessels up to 20 feet draft, there being more room to work in. Though open southward a heavy sea seldom reaches as far as the anchorage, and in southeasterly gales the water is comparatively smooth inside the mouth of the river. Above Fogland Point, over toward the eastern shore, is an anchorage which is much used by fishermen seeking shelter. The depths on the flats range from 10 to 14 feet; in the channel the depth is about 5 fathoms. The river is, however, seldom used as an anchorage except in case of necessity.

Tides.—The mean rise and fall of tides at Sakonnet Point is 3.6 feet; corrected establishment, 7 h. 40 m.

Shown on charts **113**, scale $\frac{1}{80,000}$, price $0.50; **353**, scale $\frac{1}{40,000}$, price $0.75.

SAILING DIRECTIONS, SAKONNET RIVER.

The following directions carry a least depth of 20 feet up to Fogland Point, and are good for steamers of 12 feet draft into Mount Hope Bay.

1. ***Approaching and Entering, from Eastward, to Fogland Point.***—Bring Hen and Chickens Light-vessel to bear *E.* ½ *S.* and steer **W.** ½ **N.**; or bring Vineyard Sound Light-vessel to bear *SE.* by *E.* ⅛ *E.* and steer **NW.** by **W.** ⅛ **W.** Pass at least 1 mile southward of Sakonnet Lighthouse, and when it bears *NNE.* steer **N.** ½ **E.** Pass a little over ¼ mile westward of the lighthouse and nearly ¼ mile westward of red bell buoy No. 4, which is about 2¼ miles above the lighthouse. When Black Point is on the port quarter, distant nearly ⅝ mile, steer **N.** by **W.** ½ **W.**, so as to leave Sandy Point 300 yards on the port beam; when Sandy Point is on the port quarter, distant about 400 yards, steer **NNE.** ½ **E.**, and then:

To anchor northward of Fogland Point.—When the lower of the two wharves above Fogland Point bears **E.** steer for the wharf on this bearing, and anchor on the flats in 10 to 15 feet water when Fogland Point bears westward of **S.**

To proceed up the river, follow the directions in section 2.

Remarks.—Passing south of Sakonnet Lighthouse Schuyler Ledge buoy should be left ¼ mile on the starboard hand. In the summer there are usually a number of fishing buoys southward of Sakonnet Point, which should not be mistaken for the ledge buoy.

On the **N.** ½ **E.** course Fogland Point will be made nearly ahead (a little on the starboard bow), and **High Hill Point**, bold and dark, will be quite prominent about ¾ mile **S.** of Fogland Point. After passing **Church Point**, the point on the eastern shore 2¾ miles above Sakonnet Lighthouse, the course leads midway between the eastern shore and **Black Point**, the point on the western shore, about 2 miles above Church Point.

On the **N.** by **W.** ½ **W.** course **Sandy Point**, low, with a strip of sand beach near its end and backed by sloping highland, will be on the port bow. A red buoy will be seen on the eastern side of the channel northeastward of the point, but there is a shoal, with 15 to 18 feet over it, westward of the buoy, and to avoid it the course is laid close to Sandy Point.

The **NNE.** ½ **E.** course leads a little over ¼ mile westward of Fogland Point and clears the shoals making southwestward from it. When standing eastward for the anchorage the water shoals rapidly from 30 to 10 feet.

Dangers.—**Elisha Ledge**, a small, detached, pinnacle rock with 13 feet over it, lies 2 miles **SE.** by **E.** ⅛ **E.** from Sakonnet Lighthouse, and is marked by a buoy (can, red and black horizontal stripes), which should be given a berth of ¼ mile.

Schuyler Ledge, a small, detached ledge, the outermost of the ledges southward of Sakonnet Point, has 8 feet over it and bears **S.** by **E.**, distant nearly ¾ mile from Sakonnet Lighthouse, and is marked off its south side by a buoy (spar, red, No. 2).

Cormorant Reef, with 2 feet over it, lies 2 miles **WNW.** ½ **W.** from Sakonnet Lighthouse and about ¼ mile southward of Cormorant Rock, and is marked by a buoy (spar, black, No. 1) placed close southward of the reef.

Cormorant Rock is a bare, dark rock off the western side of the entrance to Sakonnet River, lying about ¾ mile **S.** by **W.** from **Sachuest Point**, the southern point of Sachuest Neck. Vessels should not pass between the rock and Cormorant Reef.

Island Rocks, showing bare at low water, extend eastward about 500 yards from the northeastern side of Sachuest Neck.

Church Point Reef makes off about 900 yards in a southwesterly direction from Church Point. A group of bare rocks, known as the **Old Bull Rocks**, are near the southwestern end of the reef, and are marked off their western side by a buoy (bell, red, No. 4).

Flint Point Ledge has a depth of 10 feet over it, lies about 900 yards **NE.** ¾ **N.** from **Flint Point**, the northern point of Sachuest Neck, and is marked off its eastern side by Smith Reef buoy (spar, black, No. 3).

Shoals fill the bight westward of Flint Point and the bight between Black and Sandy points.

Shoals with 9 to 15 feet over them extend about 900 yards southward and southwestward from Fogland Point. A buoy (spar, red, No. 6) is placed westward of a 9-foot spot lying about 600 yards **SW.** by **S.** from the southwestern end of the point.

McCurry Point Shoal has 5 feet of water near its outer end and extends about 650 yards in a southeasterly direction from **McCurry Point**, the point on the western shore about 1 mile above Fogland Point.

1 A. ***Approaching and Entering, from Westward.***—From Brenton Reef Light-vessel steer **E.** by **S.**; or, from the whistling buoy off Point Judith, steer **ENE.** ½ **E.** As soon as Sakonnet Lighthouse is made steer for it on any bearing between **E.** and **N.** Bring the lighthouse to bear *E.*, distant ¾ mile, and steer **N.** by **E.**, heading up the middle of the river. When ½ mile above Black Point, the point on the western shore about 2¾ miles above the northern point of Sachuest Neck, steer **N.** by **W.** ½ **W.** and continue as directed in section 1, preceding.

Remarks.—When steering for Sakonnet Lighthouse, Cormorant Rock will be left at least ¾ mile on the port hand. The **N.** by **E.** course leads about ¾ mile eastward of Sachuest Neck, and ½ mile westward of Church Point. Fogland Point will be ahead; and **High Hill Point,** which appears as a nubble with a steep face westward, will be a little on the starboard bow. Two small hills on **Fogland Point** will show westward of High Hill Point. See also the remarks and dangers under section 1, preceding.

2. ***From Fogland Point to Mount Hope Bay.***—Having followed the directions in section 1 or 1 A, preceding, continue the **NNE.** ½ **E.** course past Fogland Point, and leave black spar buoy No. 5 on the port hand. When *Gould Island*, which will show prominently, bears **N.** by **E.** ⅛ **E.**, steer for it, keeping the bearing, with the western end of Fogland Point astern. As Gould Island is approached haul a little eastward so as to leave it about 250 yards on the port hand and then steer **N.** by **E.** for the draw of the stone bridge. From this bridge steer directly for the draw of the railroad bridge, about ¾ mile farther up; and when through the latter draw make good a **N.** by **E.** ½ **E.** course into Mount Hope Bay, taking care to avoid an 11-foot shoal lying off the fish factory just westward of mid-channel.

Bound to Fall River, follow the eastern shore, giving it a berth of about ¼ mile until Spar Island (the small, low, grassy island in Mount Hope Bay) bears **NW.** by **W.**, when haul closer in and give the shore a berth of about 300 yards until up to the city.

Bound into Narragansett Bay, round *Common Fence Point*, the point about 1 mile above the second bridge, at a distance of at least ¼ mile, and leave the red bell buoy 150 yards on the port hand. Then steer about **SW.** by **W.** ¾ **W.**, heading midway between Bristol Ferry Lighthouse and Muscle Shoal Lighthouse, with Hog Island Shoal Lighthouse directly ahead. Leave Hog Island Shoal Lighthouse 300 yards on the starboard hand, and steer **W.**

Remarks.—Vessels of 12 feet or less draft can easily follow the above directions without danger. The only trouble will be in passing through the draws of the bridges. The great difference of water level in that part of the river between the two bridges and that outside causes a very strong current, and makes passing through the draws dangerous.

Dangers.—The bight northward of Fogland Point has a depth of 9 to 15 feet; and the whole western half of the river between McCurry Point and the stone bridge is shoal, with a depth varying from 7 to 17 feet.

For the dangers from Common Fence Point to Hog Island, see "Sailing Directions, Mount Hope Bay," page 142.

NARRAGANSETT BAY.*

The entrance to this bay is between **Brenton Point,** the southwestern point of Rhode Island on the east. and Point Judith Neck on the west. Sakonnet River, strictly speaking, may be regarded as a part of Narragansett Bay, but is treated under a separate heading (see page 128). Between Brenton Point and **Narragansett Pier** (at the northern extremity of Point Judith Neck) the entrance is about 4½ miles wide; but above this the width of the bay varies from 3 to 6 miles, and appears somewhat irregular in shape on account of deep indentations and the two large islands, Conanicut and Prudence, nearly in its middle. The length of the bay, from the entrance to its northern extremity at the mouth of the Providence River, is 16 miles. It is the approach by water to the cities of Newport, Providence, Fall River, and Taunton, and to a number of towns and villages, the most important of which are Bristol, Wickford, and Greenwich.

Conanicut Island, lying in the lower part of the bay near its entrance, is about 7½ miles in length in a **NNE.** and **SSW.** direction, is irregular in shape, but has an average width of about 1 mile. Its surface is hilly and

*Shown on charts **8**, scale $\frac{1}{400,000}$; **113**, scale $\frac{1}{80,000}$, price of each $0.50; **353**, scale, $\frac{1}{40,000}$, price $0.75; and in part on chart **353²**, scale $\frac{1}{20,000}$, price $0.40.

undulating, the greatest height being about 135 feet, and its shores are in general fairly bold-to. On its eastern side opposite the city of Newport is the village of **Jamestown**, which has communication with Newport by a steam ferry.

Prudence Island, in the northern part of the bay, is irregular in shape, about 5¼ miles long in a general **N. ½ E.** and **S. ½ W.** direction, with a width varying from ¼ mile to 1¼ miles. Near the center of the southern part of the island the land attains its greatest height, 160 feet.

Besides the two large islands described, there are a number of small islands in the bay, which are sufficiently described in the remarks following the sailing directions.

The entrances to the bay are well marked by the lighthouses and **Brenton Reef Light-vessel** (see table, page 18), making entering easy in fair weather, and in thick weather if close attention be given to the fog signals.

The **Eastern Passage**, between Rhode Island on the east and Conanicut and Prudence islands on the west, is good for a least depth of about 10 fathoms in the channel for a distance of 12 miles above the entrance, and a depth of about 4½ fathoms to Providence River entrance, but it requires some local knowledge to carry the latter depth above the entrance to Bristol Harbor. It is also the most direct passage to Newport, Bristol, Mount Hope Bay, and Taunton River.

The **Western Passage**, between Conanicut and Prudence islands on the east and the mainland on the west, is the approach to Dutch Island Harbor, Wickford, Greenwich, and Providence River. The recently dredged cut south of Warwick Neck and the cut east of Rocky Point now form a passage through which a depth of 25 feet can be taken to Providence. Strangers of over 16 feet draft rarely go above Dutch Island Harbor without a pilot; but vessels of 16 feet draft should have no difficulty in going to the head of the bay and Providence by following the directions.

Prominent features and aids.—On the western shore, a little southward of Narragansett Pier—a much frequented summer resort—is a **tall tower** which can be seen nearly 20 miles on a clear day. **Point Judith Lighthouse**, a prominent mark for vessels standing along the coast and through the sounds, is 3½ miles southwestward of this tower. It is the turning point for vessels coming from westward and bound into the bay. The land on both sides of the entrance is hilly, and on the eastern side are a number of large summer residences with extensive lawns. The southern end of **Conanicut Island**, which is in the middle of the entrance and separates the Eastern and Western passages, is marked by **Beavertail Lighthouse** (see table, page 18). **Castle Hill Lighthouse** is on the eastern side of the Eastern Passage, and **Whale Rock Lighthouse** on the western side of the Western Passage. The passages are well marked by lighthouses, and the principal dangers by buoys, beacons, or spindles, so that the navigation of the bay is comparatively easy in clear weather.

Anchorages.—The principal anchorages for vessels seeking shelter from storms are Newport Harbor, in the Eastern Passage, and Dutch Island Harbor, in the Western Passage. These harbors afford anchorage with good holding ground for vessels of the deepest draft, and are used by coasting vessels on the passage between Vineyard Sound and Long Island Sound. Good anchorage will be found almost anywhere in the bay under the lee of the islands or the shore, and vessels becalmed or at night frequently anchor. Point Judith harbor of refuge is just west of the point.

Pilots for Narragansett Bay and the harbors in Rhode Island will sometimes be found cruising between Point Judith and Cuttyhunk and also off Block Island. If a vessel passes into the bay without having been boarded by a pilot, one may be obtained at Newport or Dutch Island Harbor. Pilotage is compulsory for foreign vessels, or vessels from a foreign port (see pilot laws for the State of Rhode Island in Appendix II).

Towboats are frequently used by vessels in the bay, especially those bound to Providence by the Western Passage, and may sometimes be found off the entrance or in Newport Harbor. It is usual for vessels entering by the Western Passage to put into Dutch Island Harbor, and from there telephone to the towboat office at Providence.

Quarantine.—The quarantine laws for Rhode Island and Massachusetts govern the ports in the respective States. Local boards of health have the power to establish rules for the quarantine of their ports (see Appendix II).

Marine Hospital.—Relief is furnished at Newport and Providence, as provided in the United States Public Health and Marine-Hospital Service regulations for stations of Class III (see Appendix IV).

Supplies.—Coal, water, and some ship-chandler's stores can be obtained at Newport, Providence, and Fall River, and provisions at most of the towns on the bay or its tributaries.

Repairs to the hulls of vessels can be made at Fall River and Providence, and to the machinery of steamers at Providence.

Storm warning displays of the United States Weather Bureau are made at Point Judith, Narragansett Pier, Newport, Saunderstown (opposite Dutch Island), and Fall River (see the table on page 24, and Appendix III).

Fogs.—In the entrance to the bay and its approach fogs are more prevalent from April to October than during the rest of the year; they are brought in by winds from **E.** through **S.** to **SW.**, and are cleared off by northerly and westerly winds; their usual duration is 4 to 12 hours, but periods of 4 to 6 days have been known, with but short clear intervals. The head of the bay will sometimes be free from fog when the entrance is completely shut in.

Ice.—Navigation in the bay and its tributaries is sometimes impeded by floating ice, and in severe winters by pack or field ice. The ice breaking up in Providence River and Mount Hope Bay is set by **N.** and **NE.** winds down the bay through the Eastern Passage, and if there is much ice a gorge is sometimes formed at Fort Adams, but is of short duration. The passages are rarely closed for any length of time below Gould Island in the Eastern, and Dutch Island in the Western, passage. During January and February Mount Hope Bay, Bristol, Providence River, Greenwich, Warren, and Wickford are usually closed to sailing vessels unaided by steam. The inner harbor of Newport is also sometimes closed during the same months, with the exception of a channel kept open by the New York steamers.

SAILING DIRECTIONS, NARRAGANSETT BAY TO THE ENTRANCE OF PROVIDENCE RIVER, BY THE EASTERN PASSAGE.

The following directions are good for the deepest-draft vessels to the anchorage off Newport and up the bay to the entrance of Mount Hope Bay, and for a draft of 20 feet to the entrance of Providence River and to the city of Providence. Vessels of over 20 feet draft if bound to Providence, and vessels of over 18 feet draft if bound to Fall River, should take a pilot.

Note.—Approaching the entrance in thick weather, Brenton Reef Light-vessel should be made and passed close-to. From the light-vessel a stranger should be able to make the anchorage in Newport outer harbor by closely following the directions and paying attention to the fog signals. See also the remarks on page 28.

1. ***Approaching and Entering, from Eastward.***—***From Buzzards Bay.***—Bring Hen and Chickens Light-vessel to bear *E.* ¼ *S.* and steer **W.** ¼ **N.** about 8 miles, to a position 1¼ miles *S.* of Sakonnet Lighthouse; and then steer **W.** by **N.** about 8 miles.

From Vineyard Sound.—Bring Vineyard Sound Light-vessel to bear *ESE.* and steer **WNW.** about 17 miles.

Passing about 1 mile south of No Mans Land.—Steer **NW.** ¾ **W.** about 27½ miles.

The above directions all lead close to Brenton Reef Light-vessel. As soon as the light-vessel is made it should be steered for, taking care, however, to keep it bearing northward of **W.** by **N.** Pass on either side of Brenton Reef Light-vessel, bring it to bear *S.* by *W.* ¾ *W.*, and steer **N.** by **E.** ¾ **E.** for 2 miles, passing about 400 yards westward of Butter Ball red bell buoy and about 650 yards westward of Castle Hill Lighthouse. When this lighthouse bears one point abaft the starboard beam, steer **NE.** by **E.** ¼ **E.**, heading for Newport Harbor (Goat Island) Lighthouse. Then:

Bound into Newport Harbor, follow the sailing directions under that heading, page 139.

Bound up the bay, proceed as directed in section 2, following.

Remarks.—When approaching the entrance, the tall tower southward of Narragansett Pier will be a conspicuous mark on the port bow. In clear weather Brenton Reef Light-vessel may be left ½ mile on the port hand, and the course into the entrance should then be **N.** ⅝ **E.** to pass westward of Castle Hill; but in thick weather the light-vessel should be passed close enough to hear the fog whistle and get a bearing.

On the **N.** by **E.** ¾ **E.** course with Brenton Reef Light-vessel astern, **Castle Hill Lighthouse** will be on the starboard bow; the lighthouse, and the bell buoy about 600 yards southwestward of it, should be left at least 150 yards on the starboard hand. **Mackerel Cove,** the long cove making into the southern side of Conanicut Island,

will be opened on the port bow. The head of this cove is separated from Dutch Island Harbor by a low, narrow strip of beach over which the vessels at anchor in Dutch Island Harbor can sometimes be seen when standing in through the Eastern Passage.

On the **NE.** by **E.** ¼ **E.** course for **Newport Harbor** (Goat Island) **Lighthouse, Fort Adams,** a large granite structure with sodded parapets, will be on the starboard bow. **Fort Wetherell** (Fort Dumpling) will be on the port bow. As the latter draws on a beam bearing, the stretch up the bay westward of Rose Island will be opened. The eastern shore above Castle Hill Lighthouse can be approached as close as 150 yards, but the northern shore, off the eastern side of the entrance to Mackerel Cove, should be given a berth of 500 yards; in the vicinity of Fort Dumpling, the shore and bare rocks should not be approached closer than 200 yards.

Dangers.—**Seal Ledge,** a detached ledge with a least depth of 17 feet over it, lies about ¾ mile **S.** by **E.** ½ **E.** from Brenton Point, and is marked at its southern side by a buoy (nun, red, No. 2).

Seal Rock is a bare rock, surrounded by shoal water, lying ½ mile **SE.** ½ **S.** from Brenton Point.

Brenton Reef, showing bare in places at low water, extends about ½ mile in a **SSW.** ½ **W.** direction from Brenton Point, and is marked at its southern end by a buoy (nun, red, No. 4).

Newton Rock has 3 feet over it, and is part of the ledge which extends about 400 yards southward from **Beavertail,** the southern end of Conanicut Island. A red and black horizontally striped bell buoy is placed about ¼ mile southwestward of the rock and about 350 yards from the southern end of the ledge.

Butter Ball Rock, a small, bare rock about 150 yards from the southern end of Castle Hill, is marked off its western side by a red bell buoy which is a little over ¼ mile southwestward of Castle Hill Lighthouse.

Kettle Bottom Rock is on the northern side of the channel about 300 yards southeastward of the eastern point of the entrance to Mackerel Cove. The rock is always bare, and there are spots with 8 to 15 feet over them northeastward of it. The shore in this vicinity should be given a berth of 500 yards.

If beating into the Eastern Passage.—To avoid Brenton Reef, when standing eastward go about just before Castle Hill Lighthouse bears *N.* by *E.* ¼ *E.* When well up to Castle Hill Lighthouse, to avoid Butter Ball Rock, pass westward of the bell buoy lying 300 yards westward of the rock. Above Castle Hill Lighthouse the eastern shore can be approached as close as 200 yards.

When standing westward care should be taken to avoid Newton Rock and the ledge making southward from Beavertail. The shore from Beavertail Lighthouse to the entrance of Mackerel Cove should be given a berth of about 400 yards to insure safety. The entrance of Mackerel Cove has deep water; but care must be taken to avoid Kettle Bottom Rock, which should in no case be approached closer than 150 yards from southward. When well eastward of Kettle Bottom Rock give the south shore a berth of 200 yards, and on the north shore keep 200 yards outside of a line drawn from one dry rock to another. Kettle Bottom Rock and the dangers off the north shore, between Fort Dumpling and Mackerel Cove, can be avoided by keeping Newport Harbor Lighthouse open to the right of Fort Wetherell (Fort Dumpling).

1 A. ***Approaching and Entering, from Westward.***—When Point Judith Lighthouse is made, steer so as to pass about 1 mile southward of it and close to the whistling buoy, and from the latter steer **NE.**, heading for Castle Hill. When nearly up to Castle Hill Lighthouse haul a little northward so as to pass about ¼ mile westward of it; and when it bears **SE.** steer **NE.** by **E.** ¼ **E.** for Newport Harbor Lighthouse, and follow the directions in section 2, following. If bound into Newport Harbor follow the directions for that harbor.

See also the directions preceding for beating into the Eastern Passage.

In thick weather, from the whistling buoy off Point Judith steer **NE.** ½ **E.** for 7 miles until close to Brenton Reef Light-vessel, and then follow the directions in section 1, foregoing.

Remarks.—When standing on the **NE.** course from the whistling buoy off Point Judith, Brenton Reef Light-vessel will be made on the starboard bow and Beavertail Lighthouse on the port bow, and the course leads about midway between them. Castle Hill Lighthouse should be made ahead. The Western Passage into Narragansett Bay will be open between Beavertail Lighthouse on the east and Whale Rock Lighthouse on the west. *If beating,* a good rule to follow is to go about when ½ mile from the shore between Point Judith and Whale Rock. See also the remarks under section 1, preceding.

Dangers.—There are **several detached spots** with 3½ to 4½ fathoms over them lying from ¼ to 1 mile southward and southwestward from Point Judith. In heavy southerly gales the sea breaks on these spots.

The shore for a distance of 2¾ miles northeastward of Point Judith is foul and should be given a berth of ½ mile. Abreast the tower it is bold-to, but abreast Narragansett Pier there are shoals and rocks which extend about 300 yards from the shore. A **small, detached, 14-foot spot,** lying ¾ mile **SW.** by **W.** from Whale Rock Lighthouse, is marked by a black spar buoy.

See also the dangers under section 1, foregoing.

2. ***From abreast Fort Adams to Prudence Island Lighthouse.***—Having followed the directions in section 1 or 1 A, preceding, when, on the **NE.** by **E.** ¼ **E.** course for Newport Harbor (Goat Island) Lighthouse, the outer bare rocks of The Dumplings are on the port beam and Rose Island Lighthouse bears *NNE.*, steer **N.** by **E.** When Gull Rocks Lighthouse bears *E.* by *S.* steer **NNE.** ¾ **E.** about 6½ miles; Prudence Island Lighthouse should then bear on the port beam distant ¼ mile. Then:

Bound to Fall River or Taunton, follow the sailing directions under the heading Mount Hope Bay and Taunton River.

Bound to Bristol, follow the sailing directions under the heading Bristol Harbor.

Bound to Warren River, Providence, or Rocky Point, proceed as directed in section 3, following.

Remarks.—When the course has been changed from **NE.** by **E.** ¼ **E.** to **N.** by **E.**, Fort Adams will be on the starboard beam, and the western edge of **Gould Island** should be a very little on the starboard bow. The course leads about 400 yards eastward of The Dumplings, and 400 yards westward of Rose Island Lighthouse. Gull Rocks Lighthouse will be nearly abeam when past the northern end of Rose Island, and a number of buoys will be seen eastward of the sailing line. The large buildings of the U. S. Training Station and Naval War College will show conspicuously on **Coaster Harbor Island,** and at night the lights in the buildings and around the grounds will be plainly visible.

On the **NNE.** ¾ **E.** course **Gould Island,** lying in the middle of the Eastern Passage about 2 miles above Rose Island, and **Prudence Island,** large hilly island, will be on the port bow. On the eastern side of Gould Island is the lighthouse, and on **Sand Point,** a small point on the eastern side of Prudence Island, is **Prudence Island Lighthouse.** Gould Island will be left ⅜ mile on the port hand. **Coddington Cove,** a good anchorage in southerly and easterly winds, will be on the starboard beam when abreast Gould Island. Vessels in the Eastern Passage, when bound to Wickford or East Greenwich, pass between Conanicut and Prudence islands, carrying a depth of 3½ to 4½ fathoms. The sailing line passes ⅝ mile eastward of Halfway Rock spindle and about midway between Prudence Island and **Dyers Island,** the small, low, grass-covered island lying east from the southern end of Prudence Island. The shore of Prudence Island, for a distance of 1¼ miles below the lighthouse, is bold-to and can be approached as close as 150 yards.

Dangers.—**The Dumplings** are a cluster of bare and sunken rocks lying off **Bulls Point,** the southeastern point of Conanicut Island. They are easily avoided by passing over 200 yards eastward of the rocks, which are out of water.

Rose Island North Shoal extends about 300 yards northward and 550 yards northeastward from the north end of Rose Island and has 9½ feet of water at its end. The northwestern end of the shoal is marked by a buoy (spar, red, No. 6) and the northeastern end by a buoy (spar, red, No. 8).

Bishop Rock Shoal, a small, detached shoal with 8½ feet of water over it, lies about 300 yards westward of **Bishop Rock,** the small, bare rock about ¼ mile **N.** from Coasters Harbor Island. The shoal is marked off its western side by a buoy (bell, red).

The Sisters, a small, rocky shoal, which shows bare at low water, lies about 200 yards from the shore and about ¼ mile **N.** by **E.** ¾ **E.** from Bishop Rock. The western side of the shoal is marked by a buoy (spar, red, No. 10).

Halfway Rock, a small ledge showing bare at its southern end, lies nearly 1⅞ miles **NNE.** ⅝ **E.** from Gould Island Lighthouse and about ⅞ mile **SSW.** from the southern end of Prudence Island. A spindle (black, cage on top) is on the bare part of the ledge.

Fiske Rock, a detached rock with 12 feet over it, lies ¼ mile **NE.** ½ **N.** from the spindle on Halfway Rock, and is marked by a buoy (spar, red and black horizontal stripes). Strangers should not pass between the buoy and spindle.

Dyers Island Shoal, a part of which is bare at low water, extends nearly ⅝ mile southward and southwestward from Dyers Island, and is marked on its western edge by a buoy (spar, red, No. 12). A bar, with 8 to 17 feet over it, extends southward from the buoy to the shore.

Coggeshall Ledge has 7 feet at its end, extends nearly ⅝ mile **N.** from **Coggeshall Point,** the point on the eastern shore 1⅛ miles **SE.** by **S.** from Prudence Island Lighthouse, and is marked at its northern end by a buoy (spar, red, No. 14).

3. *From Prudence Island Lighthouse to Providence River Entrance.*—When Prudence Island Lighthouse bears *W.*, distant about ¼ mile, steer **N.** by **E.** about 1¼ miles until Hog Island Shoal Lighthouse bears *E.* Then steer **N.** by **W.** about 1¾ miles, passing nearly ⅝ mile westward of Popasquash Neck. When *North Point* (the northern point of Prudence Island) bears *NW.* ½ *W.*, steer **N.** by **E.** until Conimicut Lighthouse bears **NNW.** ¾ **W.**; then steer for the lighthouse, keeping close on this bearing, until it is ¼ mile distant ahead, and then follow the sailing directions under the heading Providence River.

Vessels of less than 14 feet draft bound to Rocky Point.—Steer **N.** by **E.** from Prudence Island Lighthouse as directed above; and when Hog Island Shoal Lighthouse bears *E.*, steer **N.** by **W.** ¾ **W.** about 4 miles, leaving the northern end of Prudence Island more than ½ mile on the port hand. When the wharf at Rocky Point bears **WNW.** steer for it, and anchor in 15 feet water about 500 yards from its end.

Bound into Warren River, follow the sailing directions under heading Warren River.

Remarks and dangers.—On the **N.** by **E.** course from Prudence Island Lighthouse, Popasquash Neck will be ahead. **Hog Island**, the hilly island in the entrance to Bristol Harbor, with Hog Island Shoal Lighthouse off its southeast end, will be on the starboard bow. When Hog Island Shoal Lighthouse bears **E.**, the red buoy marking the southwest point of Hog Island Shoal should be nearly ¼ mile distant forward of the starboard beam.

Hog Island Shoal has 3 to 12 feet over it, and extends about ⅝ mile southward and southwestward from Hog Island. The southwestern end of the shoal is marked by a buoy (spar, red, No. 18).

On the **N.** by **W.** course, when North Point (of Prudence Island) bears **NW.** ½ **W.**, the highest part of Popasquash Neck will be a little forward of the starboard beam.

Shoals make off nearly ⅝ mile from the eastern shore of Prudence Island from 1⅛ miles above the lighthouse to its northern end. Abreast Hog Island the shoal has 7 to 14 feet over it; **Mount Tom Rock**, bare at lowest tides, is on this shoal about 350 yards from Prudence Island. A buoy (spar, black. No. 5) marks the eastern edge of the shoal, 400 yards eastward of Mount Tom Rock.

Popasquash Point Shoal makes southward about 400 yards from the point, and is marked at its southeastern end by a buoy (spar, black, No. 1).

The **N.** by **E.** course passes nearly ⅝ mile westward of Popasquast Neck, which can be approached as close as 300 yards with 3¾ fathoms water; a white church spire will be conspicuous a little on the port bow. Ohio Ledge buoy will be made on the port bow, and to carry the best water it should be left ⅝ mile on the port hand. The entrance to Warren River will be opened on the starboard bow, and the white tower on Nayat Point and Conimicut Lighthouse will be well on the port bow.

A **shoal** with a depth of about 10 feet over it makes northward a little over ½ mile from the north point of Prudence Island, and is marked near its northern end by Fork Rock buoy (spar, red and black horizontal stripes).

Ohio Ledge, a small ledge with 8 feet over it, lies nearly 1⅝ miles **NE.** by **E.** from the north point of Prudence Island, and 2¼ miles **S.** by **E.** ½ **E.** from Conimicut Lighthouse. The ledge is near the southeastern end of an extensive shoal, with 15 to 17 feet over it, which extends nearly 1 mile northward; it is marked near its southern end by a buoy (can, red and black horizontal stripes). At night a narrow red sector in Conimicut Light covers this ledge.

On the **NNW.** ¾ **W.** course care should be taken to keep close on the bearing so as to carry more than 25 feet of water. Vessels desiring a towboat for Providence River can anchor in 5 to 8 fathoms water about ⅝ mile southeastward of Conimicut Lighthouse.

Shoals, with depths of 9 to 18 feet over them, fill the bight between Warren River entrance and Nayat Point, the eastern point at entrance to Providence River. These can be avoided by keeping Conimicut Lighthouse bearing northward of **NW.** ½ **N.** until within ½ mile of it.

Conimicut Middle Ground is the extensive shoal which makes off 1 mile from the shore south of Conimicut Point. The depths on this shoal range from 2 to 15 feet and the bottom has many rocky patches. On the eastern edge of the Middle Ground, and a little over ¾ mile **S.** ½ **E.** from Conimicut Lighthouse, is a buoy (black, gas-lighted).

SAILING DIRECTIONS, NARRAGANSETT BAY TO THE ENTRANCE OF PROVIDENCE RIVER, BY THE WESTERN PASSAGE.

The least depth on the sailing lines is 4 fathoms as far as Providence River entrance, but local knowledge is required for a greater draft than 16 feet.

1. ***Approaching and Entering, from Eastward.***—Follow the directions in section 1, page 132, until up to Brenton Reef Light-vessel. Pass on either side of the light-vessel, bring it to bear *SE.* by *E.* ¼ *E.*, and steer **NW.** by **W.** ¼ **W.**, heading for Whale Rock Lighthouse. When Beavertail Lighthouse bears *NE.* make good a **N.** by **E.** ¼ **E.** course directly for Dutch Island Lighthouse, taking care to keep Plum Beach Lighthouse open a little westward of Dutch Island. When ½ mile from Dutch Island Lighthouse proceed as directed in section 2, following.

Bound into Dutch Island Harbor, follow the directions under that heading.

Remarks.—The **NW.** by **W.** ¼ **W.** course leads a little over ⅝ mile southward of Beavertail Lighthouse, and about 600 yards south of the bell buoy off Newton Rock. When abreast the bell buoy, the Western Passage will be opened, and Dutch Island Lighthouse will be seen northward.

The deep-water channel from Beavertail to Dutch Island is over ¼ mile wide, but the depth is variable, ranging from 4¼ to 10 fathoms.

Dangers.—**Newton Rock**, southward of Beavertail, is described on page 133.

Whale Rock, on the western side of the entrance to the Western Passage, is marked by **Whale Rock Lighthouse**, which bears **W.** ⅝ **S.**, distant 1⅛ miles from Beavertail Lighthouse. There is a **7-foot spot** about 200 yards northward of Whale Rock Lighthouse. A channel with a depth of about 8 fathoms leads between the lighthouse and the western shore, but strangers should not use it.

Jones Ledge, a small, detached, rocky spot with 9 feet over it, lies on the western side of the channel 1⅛ miles **NNE.** from Whale Rock Lighthouse. The eastern side of the ledge is marked by a buoy (spar, red and black horizontal stripes).

Austin Hollow, the bight in the western shore of Conanicut Island about 1 mile northward of Beavertail, is full of shoals, but the shore of the island above the bight to the entrance of Dutch Island Harbor can be approached as close as 200 yards.

A 17-foot spot lies about 350 yards from the western shore, and a little over ¾ mile **SW.** ¼ **W.** from Dutch Island Lighthouse. The western shore between Bonnet Point and South Ferry should be given a berth of 400 yards.

1 A. ***Approaching and Entering, from Westward.***—Pass about 1 mile *S.* of Point Judith Lighthouse, and from the whistling buoy steer **NE.** ¾ **N.** about 7¼ miles, heading fair between Beavertail and Whale Rock lighthouses. When Beavertail Lighthouse bears **SE.**, distant nearly ½ mile, steer **N.** by **E.** ¼ **E.**, heading for Dutch Island Lighthouse, and when nearly up to it proceed as directed in section 2, following.

Bound into Dutch Island Harbor, follow the directions under that heading.

Remarks.—On the **NE.** ¾ **N.** course the entrance to the western passage will be ahead, Whale Rock Lighthouse a little on the port bow, and Beavertail Lighthouse on the starboard bow.

At night a careful study of the characteristics of the lights is necessary, as a number of the lights marking the Eastern Passage will be seen on the starboard bow. The course leads nearly ¼ mile southeastward of Whale Rock Light, and gives the shore between Point Judith and the light a berth of at least ¾ mile.

On the **N.** by **E.** ¼ **E.** course the southern entrance to Dutch Island Harbor will be open just eastward of Dutch Island Lighthouse, and the passage up the bay is westward of it.

See the remarks and dangers under section 1 A, pages 133-134, and for the dangers above Whale Rock Lighthouse see the dangers under section 1, preceding.

2. ***From Dutch Island Lighthouse to Warwick Lighthouse.***—Having followed the directions in section 1 or 1 A until Dutch Island Lighthouse is ½ mile distant ahead, haul more northward and westward, steering so as to leave the lighthouse and island about ¼ mile on the starboard hand. When the northern end of Dutch Island is abeam, steer **NE.** by **N.** until Dutch Island Lighthouse bears *S.* by *W.* ⅝ *W.*, and then with it over the stern make good a **N.** by **E.** ⅝ **E.** course and pass 600 yards eastward of Plum Beach Lighthouse.

Continue on the **N.** by **E.** ⅝ **E.** course up the bay, leaving Conanicut Island Lighthouse (on the northern end of Conanicut Island) about ⅞ mile, and Hope Island (1½ miles northward of Conanicut Island) about ⅝ mile, on the starboard hand. Warwick Lighthouse should be made ahead; steer for Warwick Lighthouse, keeping it close on the bearing **N.**

by **E.** $\frac{5}{8}$ **E.**, until a little less than $\frac{1}{2}$ mile from it, and the red, gas-lighted buoy off Patience Island is 500 yards distant on the starboard beam. Then steer **NE.** by **E.** $\frac{3}{4}$ **E.**, and follow the directions in section 3.

Remarks.—The western shore of Dutch Island should in no case be approached closer than 250 yards. Dutch Island Lighthouse should be brought on the bearing astern when the northern end of the island is less than $\frac{3}{4}$ mile distant, to avoid Plum Beach Shoal.

On the **N.** by **E.** $\frac{5}{8}$ **E.** course, in clear weather, a prominent **high circular tower** at Rocky Point will be nearly ahead, and Warwick Lighthouse will be made ahead and a very little westward of the tower. The course leads at least $\frac{5}{8}$ mile from the shore of Conanicut Island and about 400 yards eastward of Plum Beach Shoal buoy (spar, black), and nearly midway between Quonset Point and Hope Island. When 2 miles from Warwick Lighthouse, the course leads into the dredged cut through the shoals off Potowomut Neck.

Dangers.—**Plum Beach Shoal** has 12 to 16 feet over it, and makes out about $\frac{1}{4}$ mile from the western shore about 1 mile above Dutch Island. The southeastern end of the shoal is marked by a buoy (spar, black), and the northeastern end is marked by Plum Beach Lighthouse (see table, page 20).

Great Ledge stretches along the west shore of Conanicut Island for a distance of $1\frac{3}{4}$ miles, its southern end lying about $\frac{1}{8}$ mile northward of Dutch Island. The distance to which this ledge extends from the shore varies from 175 yards at its southern to 500 yards at its northern end; it comprises a number of bare and sunken rocks and rises abruptly from the deep water of the channel.

General Rock, James Ledge, and **Brig Ledge** are the easternmost of a number of dangerous ledges and rocks which lie in the northern side of the bight at the entrance to Wickford Harbor, and southwestward of Quonset Point. General Rock has 10 feet over it, and is marked by a buoy (spar, red and black horizontal stripes). James Ledge has 2 feet over it, and is marked by a buoy (can, black, No. 1). Brig Ledge has 12 feet over it, and is marked by a buoy (spar, red and black horizontal stripes). These buoys bear about **SSW.** from Quonset Point.

Quonset Point Shoal extends about 450 yards southeastward from **Quonset Point,** the point on the west shore $1\frac{3}{4}$ miles **NW.** $\frac{1}{2}$ **W.** from Conanicut Island Lighthouse. The shoal is marked at its eastern end by a buoy (spar, black, No. 3).

Several rocks and shoals lie close to the shores of Hope Island, but they may all be avoided by giving the shores of that island a berth of $\frac{1}{4}$ mile.

Shoals fill the bight between Quonset Point and **Calf Pasture Point,** the point about $2\frac{1}{4}$ miles northward. To avoid these a vessel should haul eastward when the water shoals to 18 feet. Abreast Calf Pasture Point and for some distance northward of it, a shoal extends $\frac{1}{4}$ mile eastward from the shore.

Shoals make eastward from the entrance to Greenwich Bay, and extend nearly to Patience Island. For a distance of 1 mile eastward of **Pojac Point,** the southern point at the entrance to Potowomut River, the shoal has depths of 2 to 12 feet of water over it, and has a number of rocks and ledges, which are marked by a beacon (black spindle with barrel). The beacon lies $\frac{1}{8}$ mile **SW.** by **W.** $\frac{1}{8}$ **W.** from Warwick Lighthouse, and is surrounded by rocks with from 1 to 6 feet over them; **Hunts Ledge,** with 12 feet over it, lies $\frac{1}{4}$ mile **SE.** from it, and is the easternmost of the rocks surrounding the beacon. From this beacon a shoal with 14 to 17 feet over it extends $\frac{5}{8}$ mile northward and eastward and $1\frac{3}{4}$ miles in a **SSE.** $\frac{1}{2}$ **E.** direction; its southern point is marked by a buoy (spar, black, No. 5). Between this shoal and the shoal making westward and southward from Patience Island there is a channel with a least width of 300 yards and a depth of from $3\frac{1}{2}$ to 12 fathoms, leading up to Warwick Neck. The dredged channel, 400 feet wide and 25 feet deep, leads through this shoal on a **N.** by **E.** $\frac{5}{8}$ **E.** bearing for Warwick Lighthouse.

A **shoal** with 12 to 15 feet over it extends about 600 yards westward of Patience Island, and its edge is marked by a buoy (red, gas-lighted), lying $\frac{1}{2}$ mile **S.** by **E.** $\frac{1}{2}$ **E.** from Warwick Lighthouse.

3. ***From Warwick Lighthouse to Providence River Entrance.***—Having followed the directions in section 2 to a position nearly $\frac{1}{2}$ mile *S.* by *W.* $\frac{5}{8}$ *W.* from Warwick Lighthouse, steer **NE.** by **E.** $\frac{3}{4}$ **E.**, passing about midway between the lighthouse and the northwestern point of Patience Island. This course made good for $1\frac{3}{4}$ miles will lead a little northward of the buoy (spar, red and black horizontal stripes) lying $\frac{1}{2}$ mile northward of North Point (of Prudence Island). When Conimicut Lighthouse bears *N.* by *E.*, steer **NNE.** $\frac{1}{4}$ **E.** until Conimicut Lighthouse bears *NNW.* Then haul up for the lighthouse and follow the directions for Providence River.

Remarks.—On the **NE.** by **E.** $\frac{3}{4}$ **E.** course, the red gas-lighted buoy westward of Patience Island should be left about 300 yards on the starboard hand. The southern extremity of Rumstick Neck will be a little on the port bow, and the buoy off North Point (of Patience Island) will be a little on the starboard bow.

The **NNE. ¼ E.** course leads in the dredged cut through the shoals eastward of Rocky Point. The black gas-lighted buoy marking the eastern edge of Conimicut Middle Ground will be on the port bow, and will be left on the port hand when through the dredged cut.

Dangers.—A **shoal** with 10 to 14 feet over it extends about 700 yards northeast from the northern side of Patience Island.

Extensive shoals make off from the eastern side of Warwick Neck, and extend out about 2 miles to Ohio Ledge, with depths of 15 to 24 feet. The channel between these shoals and those making northward from Patience and Prudence islands is about ¼ mile wide, with depths of 4 to 10 fathoms. A dredged cut, 400 feet wide and 25 feet deep, with depths of 17 to 21 feet on either side of it, leads through the shoals eastward of Rocky Point. A spot with 15 feet over it lies on the western edge of the dredged cut, **SE.** by **E.** from Rocky Point.

The **shoal** making northward from Prudence Island, **Ohio Ledge,** and **Conimicut Middle Ground** are described on page 135.

NEWPORT HARBOR.*

This harbor is on the eastern side of the Eastern Passage of Narragansett Bay, about 3½ miles above the entrance. It is divided by Goat Island into an **inner** and **outer** harbor, and is an important harbor of refuge for coasters and yachts. The approach is well marked by lighthouses and fog signals, making it one of the easiest harbors on the coast for large vessels to enter at any time.

The **Outer Harbor** is on the western side of Goat Island, northward of Fort Adams and southeastward of Rose Island. Its entrance from southward is unobstructed; the entrance from northward, passing westward of Rose Island, is clear, but the passage eastward of Rose Island is obstructed by the rocks and ledges which lie between Coasters Harbor Island and Rose Island. The depth ranges from 6½ to 9 fathoms, and the holding ground is good. The anchorage is anywhere westward of Goat Island and the breakwater, giving them a berth of over 250 yards, and taking care not to get too near the rocks and ledges eastward of Rose Island.

The **Inner Harbor** is on the eastern side of Goat Island, and extends along the western front of the city of **Newport.** It has two entrances, the northern leading eastward of Newport Harbor (Goat Island) Lighthouse and the southern leading around the southern end of Goat Island, between it and Lime Rock Lighthouse. A channel, with a depth of 16 feet at low water, leads through the harbor from the southern to the northern entrance; but the anchorage, which is eastward of this channel, has a depth of 13 feet. The depth of water at the principal wharves is 13 feet, and at the railroad wharf 16 feet.

Brenton Cove is the bight in the southern part of Newport Harbor between **Lime Rock Lighthouse** on the east and Fort Adams on the west. It has anchorage in 15 to 17 feet water, but the holding ground is not good throughout and it is seldom used.

The city of **Newport,** on the eastern shore of the inner harbor, is one of the principal summer resorts on the Atlantic coast. It has considerable trade in coal, lumber, and building material, carried in coasting vessels; few foreign vessels enter the port.

Prominent objects.—Many prominent objects will be seen, whether the harbor be approached from southward or northward, among which are the following: Fort Adams, the buildings of the Training Station and Naval War College on Coasters Harbor Island, the buildings of the Torpedo Station on Goat Island, and the large hotels and a tall red water tank at Jamestown on the eastern shore of Conanicut Island, opposite Rose Island. Although these objects are plainly visible in clear weather, the lighthouses should be the guides at all times.

Pilots.—Strangers sometimes take a pilot; vessels can obtain one by making signal off Block Island, or lying off and on outside Brenton Reef Light-vessel with signal set until boarded. Pilotage is compulsory for certain vessels (see pilot laws for the State of Rhode Island in Appendix II).

Towboats are often used by vessels in the inner harbor when desiring to go alongside the wharves. They can be had by making signal.

Quarantine regulations for the port and quarantine anchorage will be found in Appendix II.

Marine Hospital.—Relief is furnished at Newport as provided in the United States Public Health and Marine Hospital Service regulations for stations of class III (see Appendix IV).

Storm warning displays of the United States Weather Bureau are made on the top of the customhouse and are visible from all parts of the harbor.

A **time ball** is dropped from a mast on the top of a machine shop of the United States Torpedo Station on Goat Island at noon of the 75th meridian—that is, 5 hours, 0 minutes, 0 seconds Greenwich mean time. The

* Shown on chart 353², scale $\frac{1}{20,000}$, price $0.40. See also footnote on page 130.

ball is mastheaded 5 minutes before noon, and in case it fails to drop at the proper moment, is lowered by hand 5 minutes after noon.

Supplies.—Coal and water can be had alongside the wharves or in the stream. Provisions and some ship-chandler's stores can be obtained in the city.

For **tidal data**, see the table on page 11.

For **variation of the compass**, see page 11.

Ice sometimes obstructs navigation in the inner harbor (see "Ice," page 132).

SAILING DIRECTIONS, NEWPORT HARBOR.

The following directions are good during either day or night for the deepest draft vessels to the Outer Harbor, and for vessels of less than 12 feet draft to the Inner Harbor.

1. ***Approaching and Entering, from Southwestward.***—Follow the directions in section 1 or 1 A, pages 132–133, for entering Narragansett Bay by the Eastern Passage, and then proceed as directed in paragraphs I, II, or III, following.

I. To an anchorage in the Outer Harbor.—Steer for Newport Harbor Lighthouse, keeping it bearing **NE.** by **E.** ¼ **E.** until past Fort Adams, when anchor anywhere in 8 to 9 fathoms westward of Goat Island and the breakwater, giving the shore and breakwater a berth of between ¼ and ⅝ mile.

Remarks and dangers.—**Fort Adams** will be left about ¼ mile on the starboard hand, and there are no dangers if the shore be given a berth as directed.

Mitchell Rock, a small, detached rock with 14 feet over it, lies nearly ¼ mile **WNW.** ⅝ **W.** from Newport Harbor Lighthouse, and is marked by a buoy (spar, black, No. 1).

Tracey Ledge is a small, detached rock with 9½ feet over it, lying nearly ¼ mile **NW.** by **N.** from Newport Harbor Lighthouse; it is marked on its southwestern side by a buoy (spar, black, No. 1½).

The above rocks lie about 200 yards eastward from the edge of the extensive shoals which surround Rose Island, and are marked near their southern end by a black spindle and near their eastern edge by a red pile dolphin.

II. To enter the Inner Harbor, passing south of Goat Island.—Steer **NE.** by **E.** ¼ **E.** for Newport Harbor Lighthouse until Lime Rock Lighthouse is opened from the dock north of Fort Adams, and then round the northern end of the dock, giving it a berth of at least 150 yards. Steer **SE.** by **E.** ¼ **E.**, with Lime Rock Lighthouse on the starboard bow and Goat Island dolphin on the port bow. Pass over 200 yards southeastward of Goat Island, and 150 yards south of the pile dolphin, and steer about **NE.** ½ **E.** Anchor in 13 to 16 feet of water, soft bottom, but not close enough to the wharves to interfere with the steamer and ferry traffic, and about 400 yards from Goat Island, so as not to lie in the track of the Sound steamers.

Remarks.—There is a fog bell on the northern end of the dock north of Fort Adams.

At night, when between Goat Island dolphin and Lime Rock Lighthouse, a vessel may steer for the electric lights on Commercial wharf or those at the railroad wharf, farther northward.

Anchorage in 15 to 17 feet, hard bottom, will be found in Brenton Cove, which may be entered without danger by giving its shores a berth of about 225 yards.

Dangers.—There are no dangers if the directions be even approximately followed.

A **shoal** makes out nearly 150 yards southward and southeastward from the southern end of Goat Island. A buoy (spar, black, No. 1) marks the southern edge of this shoal, and **Goat Island dolphin** (with a white electric light at night) marks its southeastern end; vessels should not attempt to pass between the island and the dolphin.

The eastern shore of Goat Island has shoals extending nearly 200 yards from it between Goat Island dolphin and the Torpedo Station wharf.

III. To enter the Inner Harbor, passing north of Goat Island.—Keep Newport Harbor Lighthouse bearing **NE.** by **E.** ¼ **E.** until within ½ mile of it, when steer more northward

and round the lighthouse at a distance of about 200 yards, and when it bears *SW.* steer **S. ½ W.** into the harbor.

When abreast the Torpedo Station wharf haul eastward and anchor as directed in paragraph II.

Remarks.—After rounding the lighthouse and when on the **S. ½ W.** course, the railroad wharf will be on the port bow and Lime Rock Lighthouse will be a little on the starboard bow. The shore of Goat Island northward and southward of the wharf on its eastern side should be given a berth of at least 200 yards. Good anchorage in 13 feet of water is found between Commercial wharf and the railroad wharf, giving the latter a berth of over 200 yards.

1 A. ***Approaching and to the Anchorage in the Outer Harbor, from Northward.***—*I. From abreast Prudence Island Lighthouse.*—Make good a **SSW. ¾ W.** course so as to pass ⅝ mile eastward of Gould Island and ¼ mile westward of Rose Island.

When Newport Harbor Lighthouse bears *E. ½ S.*, steer about **ESE.**, and anchor about ¼ mile from the shore of Goat Island or the breakwater extending northward from it.

II. From a position 1 mile eastward of Conanicut Island Lighthouse.—Make good a **S.** by **W.** course, passing 300 yards westward of Gould Island and ¼ mile westward of Rose Island. When Newport Harbor Lighthouse bears *E. ½ S.* follow the directions in the preceding paragraph.

Remarks and dangers.—On the **SSW. ¾ W.** course, Dyer Island will be left nearly ⅝ mile on the port hand, and Fiske Rock buoy and Halfway Rock spindle about ½ mile on the starboard hand. Gould Island will be on the starboard bow and Rose Island will be on the port bow; the latter should be given a berth of 400 yards to avoid the shoals making off from its north end.

On the **S.** by **W.** course all dangers will be avoided by giving the shores a berth of 300 yards until passing south of Rose Island.

The southern end of Rose Island and its eastern side should be given a good berth. See also the remarks and dangers under section 1, paragraph 1, preceding.

1 B. ***Approaching and to the Anchorage in the Inner Harbor, from Northward.***—Passing eastward of Gould Island, give it a berth of at least 200 yards. Bring Gould Island Lighthouse to bear *N. ½ W.*, and steer **S. ½ E.** heading for Newport Harbor Lighthouse, and so as to pass 150 to 200 yards eastward of Gull Rocks Lighthouse. After passing Gull Rocks Lighthouse, steer a little more eastward so as to pass nearly 200 yards eastward of Newport Harbor Lighthouse; and when the latter is abeam steer **S. ½ W.** When abreast the wharf at the Torpedo Station on Goat Island, stand over for the wharves of the city and anchor in 13 to 16 feet of water as directed in section 1, paragraph II.

Remarks.—When southward of Gould Island, Bishop Rock Shoal buoy (bell, red) will be left on the port hand. The shore of Coasters Harbor Island should be given a berth of over 100 yards, and the buoy (spar, black, No. 3) north of Gull Rocks Lighthouse should be left at least 100 yards on the starboard hand. The course after passing Gull Rocks Lighthouse leads about 120 yards from the ends of the steamboat wharves opposite the north end of Goat Island.

Dangers.—**The Sisters** and **Bishop Rock** are described on page 134.

Rose Island is surrounded by shoals which rise abruptly from deep water. On its northern and northeastern sides the shoal extends off about 450 yards, and has from 4 to 12 feet over it, with only about 5 feet on its eastern edge. Red spar buoy No. 6 marks the northwestern edge of the shoal, and a 9-foot spot off its northeastern end is marked by a buoy (spar, red, No. 8), which lies 450 yards **NW.** by **W. ½ W.** from Gull Rocks Lighthouse. See also the description under paragraph I, page 139.

Gull Rocks lie about midway between Rose Island and Coasters Harbor Island, and are small in extent. **Gull Rocks Lighthouse** (see table, page 18) is on the middle of the rocks, and may be approached as close as 100 yards on its eastern and western sides, but the shoals and rocks extend over 100 yards northward of it and 300 yards southward. These rocks are surrounded by a depth of 4½ to 5 fathoms, and north of the lighthouse are marked by a buoy (spar, black, No. 3). A small, detached 17-foot spot lies nearly 600 yards **N.** by **W.** from Gull Rocks Lighthouse.

There is a deep channel between Rose Island and Gull Rocks, and also between the latter and Coasters Harbor Island; the latter channel is the safer for strangers.

Tracey Ledge and **Mitchell Rock** are described on page 139.

A shoal, with 5 to 18 feet over it, extends nearly 400 yards southward from the southern end of Coaster Harbor Island, and extends eastward to the shore of Rhode Island.

St. Patricks Rock, with 6 feet over it, lies 150 yards from the eastern shore, and 800 yards **NE. ¾ N.** from Newport Harbor Lighthouse, and is marked by a buoy (spar, red, No. 4).

An unmarked 18-foot spot lies 275 yards from the shore, and 450 yards **NE. ¾ N.** from Newport Harbor Lighthouse; it is not a danger for the draft of vessels entering the Inner Harbor.

MOUNT HOPE BAY AND TAUNTON RIVER.*

Mount Hope Bay lies in the northeastern part of Narragansett Bay and is the approach by water to the city of Fall River, and to Taunton River, which empties into its northeastern end. It is about 6 miles long in a **NE.** by **N.** and **SW.** by **S.** direction and 2½ miles wide at its widest part. The northwestern and northern parts of the bay have depths of 13 to 17 feet, with few dangers, which are described under the sailing directions; the deep water of the bay is in its southern end and along the eastern shore. Several shallow rivers empty into the northern part of Mount Hope Bay, but they are of no commercial importance. There are two approaches by water to this bay—one through Sakonnet River and the other through the Eastern Passage of Narragansett Bay; the former is little used (see heading Sakonnet River); the entrance from the latter is marked by three lighthouses, and has a least depth of 7 fathoms in the channel until in the bay.

Taunton River has a narrow and crooked channel, with a depth of about 9 feet at mean high water, as far as Taunton. Three drawbridges cross the river between Fall River and the head of navigation. Vessels bound into the river take a towboat at Fall River.

The city of **Fall River**, on the eastern shore at the entrance to Taunton River, has a considerable coasting trade; large cargoes of coal are brought for its factories. At high water a draft of 24 feet (the deepest) has been taken up to the city; the depth at the wharves is 10 to 20 feet at low water.

Somerset, about 5¼ miles, and **Dighton**, about 7½ miles above Fall River, on the west bank of Taunton River, are two villages to which vessels occasionally bring cargoes. A draft of 16 feet can be taken to Somerset and 14 feet to Dighton.

Taunton is an important manufacturing city at the head of navigation, 12½ miles above Fall River. It has a large coasting trade in lumber and coal, carried principally in barges. Vessels of 9 feet draft can come to the city, but, as the channel is very narrow, sailing vessels are obliged to use a towboat.

Anchorage.—There is good anchorage in 3½ to 5 fathoms water abreast the city of Fall River. Vessels can anchor anywhere in the bay where the depth and bottom are suitable.

Pilots for vessels bound to Fall River can be obtained at the entrance to Narragansett Bay; the rates of pilotage are the same as for ports in Rhode Island (see Appendix II).

Towboats are seldom used except by the largest vessels and those bound into Taunton River; they can be had from Fall River or may be taken at Newport.

Supplies.—Ship's supplies and coal for steamers can be had at Fall River.

Repairs.—There is one marine railway capable of hauling out vessels of about 800 tons.

Storm warning displays of the United States Weather Bureau are made at Fall River.

Harbor regulations for Fall River are contained in the extracts from the Laws of the Commonwealth of Massachusetts, under the heading "Harbor Control," in Appendix II.

Quarantine.—Extracts from the Regulations of the Board of Health of the city of Fall River are given in Appendix II.

For **tides** see table, page 11.

Ice generally closes Taunton River from December to March. Mount Hope Bay is occasionally closed to navigation. See also page 132.

SAILING DIRECTIONS, MOUNT HOPE BAY.

These directions if closely followed will carry a least depth of 18 feet at low water to the city of Fall River; vessels of deeper draft should take a pilot.

Directions are given on pages 129–130 for approaching Mount Hope Bay through Sakonnet River, and passing up the bay to Fall River.

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* Shown on chart **353**, scale $\frac{1}{40,000}$, price $0.75.

Entering and passing through Mount Hope Bay to Fall River.—Having followed the directions on pages 132–134 for the Eastern Passage of Narragansett Bay, when abreast Prudence Island Lighthouse bring Hog Island Shoal Lighthouse in range with Bristol Ferry Lighthouse, bearing about **NE.** ⅝ **E.**, and steer for Hog Island Lighthouse, keeping the range. When ¼ mile from the lighthouse, steer so as to pass 300 yards southward of it, and then make good a **NE.** by **E.** course, passing about midway between Bristol Ferry Lighthouse and Muscle Shoal Lighthouse.

Having stood on the **NE.** by **E.** course nearly 4 miles from Hog Island Shoal Lighthouse, black spar buoy No. 5 should be left about 75 yards on the port hand and red spar buoy No. 2 on the starboard hand; Borden Flats Lighthouse should be a little on the starboard bow. Continue on the course, following the line of black spar buoys, and leaving buoys Nos. 7 and 9 about 75 yards on the port hand. When Borden Flats Lighthouse is about 1¼ miles distant ahead, and Spar Island bears on the port quarter, steer **NE.** by **E.** ¾ **E.** so as to pass about 300 yards eastward of the lighthouse, taking care, however, to give the eastern shore a berth of over 200 yards. Anchor eastward or northeastward of the lighthouse in 3¼ to 7¼ fathoms of water.

Bound up Taunton River, a stranger should take a pilot.

Remarks.—**Bristol Ferry Lighthouse** is on the northern side of the entrance to Mount Hope Bay, and **Muscle Shoal Lighthouse** on the southern side. The lighthouses furnish excellent guides; all shoals and dangers with less than 16 feet over them can be avoided until nearing Borden Flats by keeping Prudence Island Lighthouse bearing between Bristol Ferry and Muscle Shoal lighthouses, and giving the eastern shore of the bay within these bearings a berth of about 200 yards. Vessels of over 16 feet draft must follow the directions closely to avoid the shoals on both sides of the channel.

Dangers.—The shore southward of Hog Island Shoal Lighthouse should be given a berth of at least 500 yards.

Between Muscle Shoal Lighthouse and **Common Fence Point** (the western point at the northern entrance to Sakonnet River) shoals make out from the shore to a distance of 300 to 600 yards; northward of Common Fence Point the extremity of the shoal is marked by a buoy (bell, red).

There are **shoals** and **rocks** in the bight between Bristol Ferry Lighthouse and **Mount Hope Point** (the point 1⅝ miles northeastward of the lighthouse), but near the edge of the shoals are two buoys (spars, black, Nos. 1 and 3).

Spar Island, the small, low, flat-topped island near the center of Mount Hope Bay, is surrounded for a distance of nearly 400 yards by shoals, with 8 to 10 feet over them.

The **eastern edge of the shoals** lying between Mount Hope Point and Borden Flats Lighthouse, has 14 to 17 feet over it, and is marked by five black spar buoys, the southernmost of which is No. 5.

Spots with 17 and 18 feet over them lie on the eastern side of the channel, about 300 yards eastward of black spar buoys Nos. 5, 7, and 9. A red spar buoy, No. 2, marks the eastern side of the channel abreast buoy No. 5.

Borden Flats, with 5 to 10 feet on them, extend from Borden Flats Lighthouse to **Brayton Point,** nearly 1 mile westward of the lighthouse.

In the bight northward of the railroad wharves at Fall River there is a depth of 13 to 17 feet.

BRISTOL HARBOR*

is a cove lying between **Bristol Neck** on the east and **Popasquash Neck** on the west, and northward of Hog Island, which lies in the middle of the entrance with a channel on either side of it. The cove is about 2 miles long **N.** and **S.**, and 1¼ miles wide at its southern end, narrowing to ⅝ mile at its northern end. The harbor proper (northern part of the cove) is about 1 mile long and nearly ½ mile wide, has a depth of 15 to 17 feet, and excellent anchorage in soft bottom abreast the town. The northern part of the harbor above the railroad wharf is shallow, having a depth of 5 to 12 feet.

Bristol, a town on the eastern side of the harbor, has but little trade and is of no commercial importance. Near the southern end of the water front of the town is a shipyard where torpedo boats and yachts are built.

Channels.—There are two channels leading up to the entrance of the harbor proper. The **Eastern Channel,** eastward of Hog Island, between it and Bristol Neck, has a width varying from 200 to 600 yards (the average width being only about 300 yards) and a depth of 3 to 4½ fathoms. The **Western Channel,** westward of Hog Island, between it and Popasquash Neck, has a width of 300 to 600 yards (the average width being about 500

*Shown on chart **354**, scale $\frac{1}{20,000}$, price $0.20. See also footnote on page 130.

yards) and a depth of 3 to 4¾ fathoms. These two channels converge and come together ⅛ mile northward of the northern end of Hog Island, at the extremity of the shoal making off from it, and at the lower end of the harbor proper. The Western Channel is the better marked and one mostly used.

Pilots are not necessary for vessels desiring to enter the harbor.

Anchorage.—Good anchorage is found in 15 to 17 feet abreast the town, giving the eastern and western shores a berth of 200 yards.

Wharves.—At low water 8 to 11 feet can be taken to some of the wharves.

Communication.—Bristol is connected by rail with Warren, which is in turn connected by rail with Providence and Fall River. A regular steamer line between Fall River and Providence stops at Bristol.

Supplies.—Provisions and coal, in limited quantities, can be obtained at Bristol.

Tides.—The mean rise and fall of tides is 4.1 feet.

The velocity of the **tidal currents** is not great enough to interfere materially with the navigation of the channels and harbor.

Ice.—See remarks on page 132.

SAILING DIRECTIONS, BRISTOL HARBOR.

The following directions are safe for vessels of 15 feet, or less, draft to an anchorage abreast the town.

1. ***Approaching and Entering, by the Eastern Channel.***—Follow the directions for entering Mount Hope Bay, and when a little over ¼ mile eastward of Hog Island Shoal Lighthouse steer **N. ½ W.** Pass about ¼ mile westward of Pearce Rock buoy (spar, red, No. 2), and 200 yards eastward of Hog Island Rock buoy (spar, black, No. 3) and continue the course about 1 mile farther, passing 250 yards eastward of Middle Ground buoy (spar, red and black horizontal stripes). Then stand fair into the harbor, and anchor abreast the town, giving the shores a berth of at least 200 yards.

Remarks and dangers.—**Shoals** make out over ⅜ mile southward of Hog Island, and vessels must pass at least 150 yards southward of Hog Island Shoal Lighthouse.

Pearce Rock lies nearly ¼ mile **W.** from Bristol Ferry Lighthouse and is marked by a buoy (spar, red, No. 2).

The southern and western shores of Bristol Neck should be given a berth of at least 250 yards to avoid the shoals making off that distance.

The eastern shore of Hog Island should be given a berth of at least 350 yards to avoid the shoals on its eastern side. Hog Island Rock buoy (spar, black, No. 3) marks the eastern edge of the shoal about ¼ mile northward of the southeastern end of the island, and is eastward of Hog Island Rock, which has a least depth of 3 feet.

Making northward from Hog Island is **an extensive shoal** with depths of 3 to 12 feet. For about ¼ mile northward of the island this shoal ground has a width of ¼ mile, thence it narrows to a point at the junction of the eastern and western channels 1 mile northward of the island. The northern end of the shoal, known as the **Middle Ground,** has a depth of only 5 feet, and is marked by a buoy (spar, red and black horizontal stripes). Near the western edge of the shoal, about ¼ mile northward of the northwestern end of the island, is **Castle Island,** a small, bare rock marked by Castle Island beacon (stone tower, surmounted by a red ball).

1 A. ***Approaching and Entering, by the Western Channel.***—*I. Coming from Southward.*—From a position about ¼ mile eastward of Prudence Island Lighthouse, make good a **N. ¾ E.** course for 2 miles, and when the southwestern point of Hog Island is nearly in range with Hog Island Shoal Lighthouse, the lighthouse bearing *SE.* by *E.*, steer **NE. ¼ N.** Popasquash Point Shoal buoy will be left about 200 yards on the port hand; Castle Island beacon and Middle Ground buoy should be left 300 yards on the starboard hand, and Usher Rocks buoy about 200 yards on the port hand. When Middle Ground buoy bears *E.*, stand northward up the middle of the harbor, and anchor abreast the wharves in 16 to 17 feet water.

II. Coming from Northward.—Give the eastern shores of Prudence Island a berth of over ¼ mile, and the western shore of Popasquash Neck a berth of at least 300 yards.

Round Popasquash Point at a distance of ¼ mile, leaving the buoy on the port hand; and when the point bears about *W.*, steer **NE. ¼ N.**, and follow the directions in paragraph 1, foregoing.

Remarks.—On the **N. ¾ E.** course, the highest part of Popasquash Point near its western side is directly ahead.

Dangers.—**Castle Island** and **Middle Ground** are described under section 1, foregoing. The southwestern end of Hog Island Shoal, making off southwestward from the island, is marked by a buoy (spar, red, No. 18).

Popasquash Point Shoal makes off 400 yards in a **SSE.** direction from Popasquash Point, has 3 to 17 feet over it, and is marked at its southern edge by a buoy (spar, black, No. 1).

Usher Rocks, bare at low water, lie on the western side of the channel 800 yards **NNW. ¾ W.** from Castle Island beacon. Eastward of the rocks on the edge of the channel is Usher Rocks buoy (spar, black, No. 3).

Usher Cove, lying westward of Usher Rocks, is shoal.

WARREN RIVER*

is a small river emptying into the head of Narragansett Bay, about 2 miles southeastward of the mouth of Providence River. **The channel** leading up to the town is narrow and crooked, and although well buoyed, strangers should not attempt to ascend the river without a pilot. A draft of about 14 feet can be taken up to Warren at high water.

Warren, the town on the east bank of Warren River, about 1¼ miles above its mouth, is of but little commercial importance.

Tides.—The mean rise and fall of tides is 4.6 feet.

The **tidal currents** in some parts of the river run with considerable velocity, especially along the town front.

GENERAL DIRECTIONS TO AN ANCHORAGE IN THE MOUTH OF WARREN RIVER.

The following directions lead in a least depth of 15 feet to the anchorage.

In approaching from southward be guided by the directions in section 3, page 135, for approaching Providence River by the Eastern Passage. Give the western shore of Popasquash Neck a berth of 400 yards, and when abreast North Point (the point where the shore of the neck turns abruptly eastward) steer **NE. ½ N.** Leave Rumstick Shoal buoy (black, gas-lighted) 250 yards on the port hand, and steer about **NE.** by **N.** Anchor about ¼ mile from the eastern shore when Rumstick Rock bears *WNW.*, in 15 to 16 feet, soft bottom.

If coming from northward, bring Conimicut Lighthouse to bear *NW.* by *N.* and steer **SE.** by **S.** until Rumstick Rock bears *NE.* by *E.* Then change the course to **ESE. ½ E.**, and pass at least 300 yards southward of Rumstick Shoal buoy (black, gas-lighted). Then haul up to **NE.** by **N.**, passing 250 yards eastward of the buoy, and anchor about ¼ mile from the eastern shore when Rumstick Rock bears *WNW.*, in 15 to 16 feet, soft bottom.

Remarks.—From the anchorage the river will be fairly opened and the houses of the town of Warren can be seen. The next buoy (black, No. 3) marking the channel lies nearly ¼ mile **N. ½ E.** from the anchorage, but strangers should not attempt to go above it without a pilot.

Dangers.—The dangers in approaching the river are described under section 3, page 135.

A sunken rock and **rock awash** at low water lie about 200 yards northward of North Point.

Deyer Rock, a rock awash at low water, lies about 125 yards from the eastern shore, a little over ¾ mile above North Point.

The Brothers are two sunken rocks, with 7 feet over them, lying a little over 200 yards from the shore and about 350 yards northward of Deyer Rock.

The above-described dangers may be easily avoided by giving the eastern shore a berth of over 300 yards.

Rumstick Shoal extends nearly ⅝ mile southward from Rumstick Neck, is about ⅝ mile wide, and has a depth of 3 to 12 feet, the ruling depth being about 7 feet. Near its southeastern extremity it is marked by a black gas-lighted buoy, and on its eastern edge, nearly ¼ mile **SE. ½ E.** from the southern extremity of Rumstick Neck, is black spar buoy No. 3.

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*Shown on chart **355**, scale, $\frac{1}{10,000}$, price $0.20. See also footnote on page 130.

Rumstick Rock, showing well above water at all stages of the tide, is on Rumstick Shoal and lies **WSW. ¼ W** from the southern extremity of Rumstick Neck.

Rumstick Ledge, a bare ledge nearly 100 yards long in a **NW.** and **SE.** direction and about 15 yards wide, lies about 150 yards northwestward of Rumstick Rock and near the western edge of Rumstick Shoal. The ledge is surrounded by a depth of 2 to 5 feet, but 100 yards westward of it the water deepens to 21 feet.

PROVIDENCE RIVER*

empties into the head of Narragansett Bay, and is the approach by water to the city of Providence and town of Pawtuxet. The entrance between Nayat Point on the east and Conimicut Point on the west is about ¼ mile wide, but is obstructed by shoals on both sides, which leave an available channel about ¼ mile wide. On **Nayat Point** there is an old lighthouse tower now only serving as a day mark, and on the shoal making out from **Conimicut Point** is **Conimicut Lighthouse** (see table, page 20).

The city of **Providence**, about 7 miles above the entrance to the river and at its junction with Pawtucket River, is an important commercial port. The deepest draft taken to the city is 24 feet. **East Providence**, a suburb of the city of Providence, is on the east bank of the river and is connected with the city proper by three drawbridges crossing the Pawtucket River.

Pawtucket is a city at the head of navigation on the **Pawtucket River** about 4½ miles from its mouth. For about 1 mile above its mouth the river has a deep but crooked channel, but higher up it is very shallow. Under the supervision of the U. S. Army Engineers a channel 100 feet wide and 13 feet deep at mean low water has been completed as far as the city wharves, and was good for a draft of 14 feet in 1902. The channel is buoyed, but it is too crooked and narrow for sailing vessels to navigate without the assistance of a towboat.

The village of **Pawtuxet**, on the west bank of Providence River about 3½ miles above its mouth, has no commerce and can only be reached at high water by vessels of 7 feet draft.

Channel.—The channel of Providence River, leading between extensive shoals which make out from both shores, is well marked by lighthouses and other aids and can be readily followed in the daytime in clear weather. For a width of 400 feet the channel has a least depth of 25 feet to the city of Providence. From Conimicut Lighthouse to abreast **Sabine Point Lighthouse**, a distance of 3 miles, the 3½-fathom channel has a width varying from 250 to 300 yards. From Sabine Point Lighthouse to the city, a distance of nearly 4 miles, the channel is dredged through flats having from 3 to 8 feet of water over them.

Anchorage.—The anchorage ground in the harbor of Providence is very limited; vessels usually anchor on the edge of the channel between Field Point and Fox Point, where the channel has been somewhat widened in order to furnish anchorage. There is anchorage eastward of Fox Point, where some of Green Jacket Shoal has been dredged to a depth of 25 feet.

Wharves and drawbridges.—There are depths of 10 to 25 feet at the wharves below the bridges. The least width of the drawbridges crossing Pawtucket River at Providence is 75 feet. Point Street drawbridge, crossing Providence River 600 yards above **Fox Point** (the point at the junction of the two rivers), has a clearance on each side of the central pier of 98 feet, and a draft of 20 feet can be taken through them to the wharves above.

Pilots.—Vessels desiring a pilot can get one at Newport, Dutch Island Harbor, or off the entrance to Narragansett Bay. See "Pilots," page 131, and the pilotage laws for the State of Rhode Island, in Appendix II.

Towboats are generally used by the larger sailing vessels, and will sometimes be found at the entrance of the river waiting for vessels expected to arrive; they may also be obtained at Newport or by telephone from Dutch Island Harbor.

Harbor and quarantine regulations for the port are given in Appendix II.

Marine Hospital.—Relief is furnished at Providence by the United States Public Health and Marine-Hospital Service as for stations of Class III. Patients requiring long-continued treatment are sent to the Marine Hospital at Chelsea, Mass. See also Appendix IV.

Supplies.—Coal and water can be obtained alongside the wharves; provisions and ship-chandler's stores in the city.

Repairs.—In East Providence there is one dry dock with a capacity for vessels of 1,300 tons, and one marine railway capable of hauling out vessels of 500 tons. There are large machine shops in Providence, with excellent facilities for repairs to the machinery of steamers.

For tides, see table, page 11.

Tidal currents are not strong, and generally follow the direction of the channel.

Ice.—In severe winters the river is closed to navigation, but in ordinary winters the towboats and steamers keep the channel open. See also "Ice," page 132.

* Shown on charts **118**, scale $\frac{1}{80,000}$, price $0.50; **353**, scale $\frac{1}{40,000}$, price $0.75; and in part on **352**, scale $\frac{1}{10,000}$, price $0.20.

SAILING DIRECTIONS, PROVIDENCE RIVER.

From the Entrance to the City of Providence.—These directions are good for a draft of 20 feet to the city of Providence.

Having followed the directions in section 3, page 135 or 137, until nearly up to Conimicut Lighthouse, haul a little eastward and leave the lighthouse about 230 yards on the port hand, and as it is passed haul more westward and steer **NW.** Bullock Point Lighthouse will be broad on the starboard bow, and will soon come in range with Sabine Point Lighthouse, bearing about *N.* $\frac{5}{8}$ *W.;* when this range is crossed, and Bullock Point Lighthouse is nearly in range with Sabine Point, haul up to **N.** $\frac{1}{2}$ **W.** and pass 250 yards westward of Bullock Point Lighthouse. Continue the **N.** $\frac{1}{2}$ **W.** course, leaving Gaspee Point buoy (spar, black, No. 3) about 125 yards, and Seal Rock Flats buoy (spar, black, No. 5) 200 yards, on the port hand; and pass about 200 yards westward of Sabine Point Lighthouse.

A red spar buoy (No. 2) will be seen a little northward of Sabine Point Lighthouse; leave this buoy 75 yards on the starboard hand, and make good a **NE.** $\frac{7}{8}$ **N.** course for $\frac{3}{4}$ mile, heading for Pomham Rocks Lighthouse. Great Bed Shoal buoy (spar, black, No. 7) will be left 75 yards on the port hand; when abreast of Pomham Rocks buoy (spar, red, No. 4), change the course to **N.** $\frac{3}{4}$ **E.** Pass about 100 yards westward of Pomham Rocks Lighthouse, and steer about **N.** $\frac{3}{4}$ **W.**, leaving black spar buoys Nos. 9 and 11 about 75 yards on the port hand; and when about 75 yards westward of Lovett Rock buoy (spar, red, No. 6), change the course to **NNW.** $\frac{1}{2}$ **W.**

Pass 75 yards westward of Fuller Rock lighted beacon, and steer **NW.** $\frac{3}{4}$ **N.**, with Sassafras Point lighted beacon a very little on the port bow. Leave red spar buoy No. 8 about 75 yards on the starboard hand, and pass 75 yards eastward of Sassafras Point lighted beacon. Then make good a **N.** by **W.** $\frac{3}{4}$ **W.** course nearly $\frac{5}{8}$ mile; and then change the course to about **N.** $\frac{1}{2}$ **W.**, and stand up to the city, following the buoys until up to Fox Point.

Remarks.—Vessels should be guided mainly by the lighthouses and buoys; the distance from one to another is short and the channel narrow. When standing on the given courses, care must be taken not to be set off them by the currents, especially between Sabine Point Lighthouse and Fuller Rock lighted beacon. A number of vessels may be found anchored in the channel above Field Point, and close attention must then be given to the buoys which mark the channel.

Dangers.—**Shoals** bound the channel its entire length, rising very abruptly in many places, and no useful description can be given of them.

GREENWICH BAY*

is situated at the northwestern end of Narragansett Bay, its entrance being between **Warwick Neck** and **Potowomut Neck.** The bay is about 2¼ miles long **E.** and **W.**, has an average width of about 1 mile, and an average depth for the greater part of its area of about 10 feet. **Old Warwick Cove** and **Brush Neck Cove** are shallow coves in the northeastern part of Greenwich Bay; on **Oakland Beach,** between these coves, is a large hotel and flagstaff which show conspicuously in Greenwich Bay. **Apponaug River,** a shallow stream, empties into the northwestern part. Nearly 1 mile above the mouth of the river is the village of **Apponaug.**

Greenwich Cove, 1¼ miles long, 300 to 600 yards wide, and with a general depth of 7 to 10 feet, makes southward from the southwestern end of Greenwich Bay. On the western shore of the cove is the town of East Greenwich.

The channel into Greenwich Cove is very narrow, with a depth of 10 feet, and strangers should not attempt to navigate it without a pilot.

Tides.—The mean rise and fall of tides is 4.5 feet.

SAILING DIRECTIONS, GREENWICH BAY.

To the Entrance of Greenwich Cove.—The following directions are good for vessels of 9 feet draft or less.

Follow the directions in section 2, page 136; pass 500 yards south of Warwick Lighthouse, and make good a **NW.** $\frac{1}{8}$ **W.** course for 1 mile. Leave Sandy Point Shoal buoy

* Shown on chart **351**, scale $\frac{1}{20,000}$, price $0.20. See also footnote on page 130.

(spar, black, No. 1) about 130 yards on the port hand, and change the course to **NW.** by **W.** ⅛ **W.** Sally Rock buoy (spar, black, No. 3) will be made on the port bow; pass about 100 yards northward of Sally Rock buoy, and steer **WSW.** ½ **W.** On this course, Chippanogset Island Shoal buoy (spar, red, No. 2) will be made right ahead; anchor eastward of this buoy in 10 to 13 feet water, and if bound to the village take a pilot.

Remarks and dangers.—The dangers eastward of Potowomut Neck are described on page 137.

A number of **sunken rocks** lie southward and southwestward of Warwick Neck, but they may be easily avoided by giving the shore a berth of over 300 yards.

Sandy Point Shoal buoy (spar, black, No. 1), lying nearly 1 mile **NW.** by **W.** ¾ **W.** from Warwick Lighthouse, marks the northern edge of the extensive shoal, with 3 to 7 feet over it, which makes off from Sandy Point.

Sally Rock, with 5 feet over it, lies nearly ¼ mile northward of Potowomut Point (the north point of Potowomut Neck), and is marked by a buoy (spar, black, No. 3). Between this buoy and the shore are other rocks and shoals, and vessels should never pass southward of it.

Chippanogset Island is the small island, with yellow bluff facing eastward, in the extreme western part of the bay, and northward of the entrance to Greenwich Cove. From this island shoals, with 1 to 4 feet over them, make off 500 yards northward and 250 yards eastward and southeastward; the southeastern extremity is marked by a buoy (spar, red, No. 2).

Shoals make out northward and northwestward for a distance of about 300 yards from Long Point, the northwestern point of Potowomut Neck. The western end of the shoals is marked by a buoy (spar, black, No. 5).

WICKFORD HARBOR,*

in the west shore of Narragansett Bay, westward of the northern end of Conanicut Island, comprises an outer and inner harbor. The **outer harbor** is a broad bight between **Quonset Point** on the north and **Wild Goose Point** on the south; between these points it is about 2 miles wide, but the northern part is full of rocks and shoals which extend nearly 1¼ miles in a southerly direction from Quonset Point; the southern part has good anchorage (soft, sticky bottom) in 14 to 17 feet of water, and the dangers on the south side of the outer harbor will be avoided by keeping eastward of a line joining **Fox Island** (the island lying ½ mile southeastward of Wild Goose Point) and Wickford Harbor Lighthouse.

The entrance to the **inner harbor** is a little more than ¼ mile wide between **Sauga Point** on the north and **Poplar Point** on the south, but the shoals making out from these points leave only a narrow channel, which is marked by and lies just northward of **Wickford Harbor Lighthouse,** which is on Old Gay Rock, about 300 yards **NE.** by **E.** from the old lighthouse tower on Poplar Point.

The entrance channel between the points leads to the common junction of three coves, **Fishing Cove** making northward, **Mill Cove** making northwestward, and **Wickford Cove** making southwestward. The first two of these coves are shallow and of no importance. Wickford Cove has a depth of about 10 feet; but the channel is very narrow—to the steamboat wharf its width is 60 feet and depth 9 feet. Strangers should not enter without a pilot, who may be had by making signal while eastward of the lighthouse.

The town of **Wickford,** on the west side of Wickford Cove, is of little commercial importance; cargoes of coal are brought to it in vessels of 12 feet draft, and a steamer runs to Newport, connecting at Wickford with the railroad. The depth at low water alongside the wharves is 7 to 10 feet.

Tides.—The mean rise and fall of tides is 4.2 feet.

Ice.—In severe winters the inner harbor is closed by ice, but the outer harbor is usually open, although drift ice is occasionally encountered. See also "Ice," page 132.

SAILING DIRECTIONS, WICKFORD HARBOR.

The following directions are safe for vessels of 12 feet draft to an anchorage ¼ mile southeastward from Wickford Harbor Lighthouse; vessels should take a pilot to enter the inner harbor.

1. ***From Northward or Northeastward.***—Pass ½ mile eastward of Quonset Point and steer **SW.** ½ **S.,** with Fox Island ahead; or, round Conanicut Lighthouse, giving it a berth of at least 300 yards, and steer **W.** ¾ **S.**

*Shown on chart 357, scale $\frac{1}{20,000}$, price $0.20. See also footnote on page 130.

Leave General Rock buoy (spar, red and black horizontal stripes), marking the southernmost of the ledges southward of Quonset Point, about 200 yards on the starboard hand. When Wickford Harbor Lighthouse bears **NW.** by **W.** ½ **W.** steer for it, being careful to keep it bearing between *NW.* by *W.* ½ *W.* and *NW.* ½ *N.* Anchor in 14 to 15 feet when within ¼ mile of the lighthouse, or anywhere in approaching it between the bearings given above.

Remarks.—The courses given above lead clear of all dangers, and can be easily followed. All dangers off the southern shore of the harbor will be cleared by giving Fox Island a berth of over 300 yards when eastward of it, and keeping eastward of a line joining Fox Island and Wickford Harbor Lighthouse. The rocks and ledges on the north side of the harbor are avoided by keeping Fox Island bearing westward of **SW.** ½ **S.**, and Wickford Harbor Lighthouse bearing northward of **NW.** by **W.** ½ **W.**

Dangers.—**A shoal,** with numerous ledges and rocks, makes southward and southwestward, nearly 1¼ miles from Quonset Point; a number of these rocks and ledges are buoyed, and 7 feet may be taken across the shoal; but strangers should always pass southward of **General Rock,** the southernmost, which has 10 feet over it, and is marked by a buoy (spar, red and black horizontal stripes). **James Ledge** has 2 feet over it, and is marked by a buoy (can, black, No. 1). **Brig Ledge,** with 12 feet over it, is marked by a buoy (spar, red and black horizontal stripes). These three are the easternmost of the dangers, and lie from ⅝ to nearly 1¼ miles **SSW.** ½ **W.** from Quonset Point.

South White Rock, marked by a granite beacon, is the southwesternmost of the rocks southward of Quonset Point, and is ⅝ mile **NNW.** ½ **W.** from General Rock.

1 A. ***From Southward.***—Follow the directions in sections 1 and 2, pages 136–137, for entering and passing up Narragansett Bay by the Western Passage, until past Dutch Island. Make good a **N.** by **E.** ⅝ **E.** course, with Dutch Island Lighthouse over the stern, until Wickford Harbor Lighthouse bears **NW.** ½ **N.**, then head for the lighthouse on that bearing.

Keep Wickford Harbor Lighthouse bearing between *NW.* ½ *N.* and *NW.* by *W.* ½ *W.* as it is approached, and anchor between these bearings about ¼ mile from the lighthouse in 13 to 17 feet of water.

See remarks and dangers under section 1, preceding.

DUTCH ISLAND HARBOR*

lies in the Western Passage of Narragansett Bay about 3 miles above Beavertail, and is a semicircular indentation ½ by 1 mile in extent making into the western side of Conanicut Island. **Dutch Island** is on the western side of the harbor, which may be entered by passing either northward or southward of the island. The harbor affords excellent anchorage in 2 to 8 fathoms, sticky bottom, is easy of access, and is frequently used as a harbor of refuge by coasters. The southern entrance is good for a depth of over 6 fathoms; but the northern entrance has a few spots with 3½ fathoms over them, and should not be attempted by vessels of over 18 feet draft.

Dutch Island Lighthouse is on the extreme southern end of Dutch Island, and is the guide for vessels coming up the Western Passage and entering Dutch Island Harbor by the southern entrance.

SAILING DIRECTIONS, DUTCH ISLAND HARBOR.

1. ***From Southward.***—Follow the directions in section 1, page 136, until less than ¼ mile from Dutch Island Lighthouse, then change the course to **NE.** ½ **E.** and stand into the harbor. Leave the black spar buoy south of Dutch Island on the port hand, and pass northward of Beaverhead Point Shoal buoy (spar, red, No. 2); anchor according to draft and direction of the wind (see remarks below).

Remarks.—In seeking anchorage, if of over 18 feet draft, give the eastern shore of the harbor a berth of at least ⅝ mile; if of less than 14 feet draft, the eastern shore may be approached as close as 300 yards and closer in places, the general depth being 15 to 17 feet. The eastern shore of Dutch Island should be given a berth of 150 yards.

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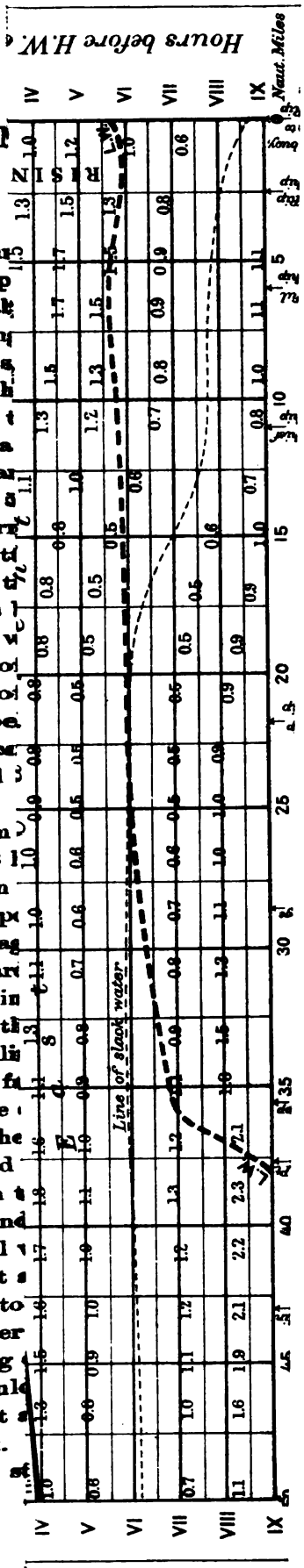
* See footnote on page 130.

In the southeastern part of the harbor there is a very shallow cove which makes southeastward about ¼ mile, and is only separated from Mackerel Cove by a narrow neck of land which joins Beavertail peninsula to the main body of the island.

Dangers.—A narrow spit makes out about 150 yards southward from Dutch Island Lighthouse, and has 6 feet of water near its extremity, where it is marked by a buoy (spar, black, No. 1).

On the south side of the entrance is a high point known as **Fox Hill**, which terminates in a bluff, rocky face northward, known as **Beaverhead**. From it a shoal makes out 250 yards westward and 400 yards northward. At its northern extremity the shoal rises abruptly from 8½ fathoms to 7 feet, and is marked by a buoy (spar, red, No. 2).

1 A. ***From Northward.***—Make good a **S.** by **W.** ⅝ **W.** course for Dutch Island Lighthouse until about ½ mile past Plum Beach Lighthouse, and then steer **S.** by **E.** into the harbor with Plum Beach Lighthouse astern. Give the northeastern end of Dutch Island a berth of at least 100 yards, and anchor according to draft and direction of the wind (see remarks under section 1, preceding).



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APPENDIX II.

PILOTS AND PILOTAGE, HARBOR CONTROL, QUARANTINE, ETC.

MASSACHUSETTS.

PILOTS AND PILOTAGE.

Extracts from Chapter 67 of the Revised Laws of Massachusetts, 1902.

Sec. 17. A pilot shall have a lien for his pilotage fees upon the hull and appurtenances of every vessel liable to him therefor under the provisions of this chapter for sixty days after the completion of his services; but the lien of a pilot for the harbor of Boston shall not attach until it has been approved by the pilot commissioners. **Lien of pilots for their fees.**

Sec. 18. A pilot shall be liable for all damages which may accrue from his negligence, unskillfulness, or unfaithfulness. **Liability of pilots for negligence, etc.**

Sec. 19. A pilot shall, if so required, exhibit his commission to the master of any vessel of which he may take charge. **Pilots to exhibit their commission.**

Sec. 20. A pilot who takes charge of a vessel drawing more water than his commission authorizes shall be suspended or removed. **Not to take charge of certain vessels.**

Sec. 21. Pilots shall first board such vessels, irrespective of size, as may have signals set for a pilot. If there are no such signals to be seen, pilots shall offer their services to the first vessel which they can board; and if a vessel liable to pilotage refuses to take a pilot, the pilot offering his services shall inform the officers of such vessel that she will be held to pay the regular fees for pilotage, whether such services are accepted or not. **To board first vessel showing signal.**

Sec. 22. Every inward-bound vessel shall, except as provided in sections twenty-five and twenty-eight, receive the first pilot who holds a commission for her port of destination who offers his services, and such vessels shall, except as provided in sections twenty-six and twenty-seven, be held to pay to such pilot the regular fees for pilotage, whether his services are accepted or not. **Inward vessel to take first pilot offering.**

Sec. 23. Every outward-bound vessel, except whaling vessels outward bound from the port of New Bedford, which is liable to pilotage if inward bound, shall, whether the services of a pilot are accepted or not, be held to pay the regular fees to the pilot who brought her into port or to some other pilot of the same boat, if he offers his services before she gets under way; or if such pilot does not so offer, or if such vessel was not piloted into port, then to the pilot who first offers his services. **Outward vessel to pay fees to inward pilot.**

Sec. 24. No vessel shall be liable to pay pilotage fees in or out of any port other than her ports of departure and destination, unless the aid of a pilot is requested, in which case the pilot shall be bound to act as such, and shall be entitled to the regular compensation therefor. **Ports where pilotage is compulsory.**

Sec. 25. Every pilot is authorized and directed to take charge, within the limits of his commission, of any vessels, not exempt from compulsory pilotage by section twenty-eight, and of vessels not bound from one port to another within the commonwealth, unless they are in the completion of a voyage from a port out of the commonwealth. **What vessels pilots are to take charge of.**

Sec. 26. Vessels of not more than two hundred tons burden, or vessels under three hundred and fifty tons register, bound into the port of Boston, which decline the services of a pilot, shall, if otherwise liable under the provisions of this chapter to the payment of pilotage fees, be liable to one-half of the regular fees; but if they request and receive such services, they shall pay the regular rates. **Certain vessels liable only for half fees.**

Sec. 27. If steam towage is taken by the desire of the master, the vessel shall pay full pilotage fees; but if taken by direction of the pilot in charge, such vessel shall pay the pilot but 75 per cent of the regular fees. **Fees of vessels taking steam.**

Sec. 28. Steam vessels regulated by the laws of the United States and carrying a pilot commissioned by United States commissioners, vessels regularly employed in the coasting trade, fishing vessels other than whalers, **Vessels exempt from compulsory pilotage.**

vessels of less than 7 feet draft of water, vessels bound into the harbor of Boston and otherwise liable to pilotage, which arrive within a line drawn from Harding's Ledge to the Graves and thence to Nahant Head before the services of a pilot have been offered, and vessels under three hundred and fifty tons register bound out of the port of Boston, shall be exempt from the compulsory payment of pilotage, but if any such vessel requests the aid of a pilot, he shall serve the same in like manner as vessels which are not exempt, and shall be entitled to the regular compensation therefor.

National vessels.

Sec. 29. National vessels which employ a pilot shall pay the same rates as vessels in the merchant service.

Period for winter and for summer rates.

Sec. 30. The period for winter rates of pilotage, if such rates are established, shall be from the first day of November to the thirtieth day of April, inclusive, and for summer rates, from the first day of May to the thirty-first day of October, inclusive. In the harbors of Boston, Cohasset, Salem, and Beverly, the rates shall be the same during the whole year; and in the harbors of Cohasset, Salem, and Beverly, the rates shall be the same as those in the harbor of Boston.

Additional fees in case of detention.

Sec. 31. If a vessel is anchored for twelve hours or more under any regulation relative to quarantine or to alien passengers, the pilot in charge, upon piloting such vessel to her port of destination, shall be entitled to an addition of twenty-five per cent to the regular fees.

Pay of pilot when carried to sea.

Sec. 32. If a pilot, without fault or negligence of his own or of his associates, is unable to leave the vessel under his charge and is carried to sea, he shall be entitled to two dollars for each day on which he is necessarily detained from home.

Anchoring of vessel, with alien passengers.

Sec. 33. A pilot who fails to anchor a vessel carrying alien passengers or a vessel subject to quarantine, at the place assigned by the proper authorities, shall be suspended or removed.

Persons not pilots forbidden to act as such.

Sec. 35. No person, unless he holds a commission as a pilot, shall, if a commissioned pilot offers his services, or can be obtained within a reasonable time, assume or continue to act as pilot in the charge or conduct of any vessel within the waters of this commonwealth, unless he is actually employed on such vessel for the voyage. * * *

PILOTAGE—SPECIAL REGULATIONS.

BOSTON HARBOR.*

Extracts from a pamphlet edition of the Laws, Rules, and Regulations for the Port of Boston to 1901.

Boston pilots, boats, and regulations. (As amended 1901.)

There shall be five pilot boats constantly employed by the Boston pilots; each boat shall have a number which shall be painted in black figures of not less than forty-eight inches in length, in the mainsail and jib. * * *

* * * * * * *

Inner station.

Each one of the pilot boats employed for the harbor of Boston, in alternate weeks, and in the order of their numbers, shall cruise on a station at the entrance of Boston Harbor outside of Boston Light, and within the limits of a line drawn from Minot's Ledge to Nahant Head; and the boat on said station shall at all times show the established pilot-boat signal, and shall by day and by night, at all times, remain on said station whenever the weather does not render it impracticable, and be on the lookout for vessels approaching Boston Harbor; and shall at all times be furnished with pilots without leaving her station, and shall offer the services of a pilot to all vessels entering said harbor, * * * and she shall receive on board pilots from outward-bound vessels, * * *

Not less than three pilot boats shall at all times cruise in Boston Bay, outside of the limits prescribed for the station boat.

Cape Cod station for Boston pilots. (Chap. 276, acts of 1873.)

There shall be two stations for Boston pilots for inward-bound vessels. The outer station shall include a distance in sight of land in fair weather from the boat's deck, from where Race Point bears south to where the Highland Light bears west-northwest. * * *

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* Includes all places accessible to vessels from sea included within the limits of Nahant Rock on the north and Point Allerton on the south.

The existing regulations of law for the inner station shall also apply to the Cape Cod station created by this act. (Chap. 276, acts of 1873.)

* * * * * * *

In addition to the stations now established, there shall be a third station for Boston pilots for inward-bound vessels which shall be established near the Boston light-ship; and the inner cruising line of this station shall be drawn from Minot's Light to Half Way Rock off Marblehead, and the outer limit of this station shall be with the light-ship in sight by day, and the lights of said light-ship in sight by night, in clear weather. Light-ship station. (Acts of 1901.)

The existing regulations of law for the two stations already established, known as the Cape Cod station and the inner station, shall also apply to the light-ship station created by this act. (Acts of 1901.)

* * * * * * *

It shall be the duty of every pilot, after having brought a vessel to the inner harbor of Boston, to have such vessel properly moored in the stream, or secured to a wharf (below the bridges), at the option of the master, within twenty-four hours after arrival, weather and tide permitting, without extra charge.

If any vessel outward bound, having a pilot on board, should anchor in Nantasket Roads, it shall be the duty of the pilot to remain on board said vessel, if requested by the master, until the next high water, and if detained after that time he shall be entitled to receive three dollars per day for each and every day so detained. Nantasket Roads.

No pilot shall leave a vessel outward bound, until to the eastward of Georges Island, without permission of the master of said vessel. * * *

The fees for hauling a vessel from the stream to a wharf (below the bridges) after the expiration of twenty-four hours from arrival, shall be four dollars; and for hauling a vessel from the wharf to the stream, provided the vessel does not proceed to sea within twenty-four hours from the time of anchoring, four dollars.

Every commissioned pilot for Boston Bay shall be attached to a pilot boat. * * *

No pilot shall take charge of any vessel of a larger draught of water than his commission authorizes, nor shall any other person, not having a commission, be put on board of any vessel from either of the pilot boats in the capacity of a pilot. But in the event of the master of any vessel taking on board an unauthorized person to assist him in going into port, the person so taken shall state the circumstances to the master of said vessel, and keep the usual signal flying for a pilot until within a line from the Harding Ledge to The Graves and Bass Point, and shall give the vessel up to any authorized pilot who may offer himself. Draught of vessel not to exceed authority of commission, and only pilot to act, except, etc.

The established pilot signal by day is a white and blue flag, white next to the mast, and in the night a red light. * * * Signals.

The pilots of the port of Boston shall have an office, or keep a desk in some counting-room in some central situation, where all communications may be left for them, and it shall be the duty of the pilots, when in Boston, to call at said office or desk twice a day at least. Boston office of pilots.

RATES OF PILOTAGE FOR BOSTON HARBOR.

Outward Rates.			Inward Rates.		
Draft of water.	Rate per foot.	Amount.	Draft of water.	Rate per foot.	Amount.
Feet.			*Feet.*		
7	$1.65	$11.55	7	$2.64	$18.48
8	1.66	13.28	8	2.69	21.52
9	1.67	15.03	9	2.73	24.57
10	1.70	17.00	10	2.77	27.70
11	1.74	19.14	11	2.80	30.80
12	1.78	21.36	12	2.85	34.20
13	2.00	26.00	13	2.95	38.35
14	2.00	28.00	14	3.45	48.30
15	2.10	31.50	15	3.50	52.50
16	2.25	36.00	16	3.55	56.80
17	2.50	42.50	17	3.75	63.75
18	2.75	49.50	18	3.80	68.40
19	3.00	57.00	19	4.00	76.00
20	3.25	65.00	20	4.25	85.00
21	3.50	73.50	21	4.50	94.50
22	3.75	82.50	22	4.50	99.00
33	4.00	92.00	23	5.00	115.00
24	4.25	102.00	24	5.00	120.00
25	5.00	125.00	25	5.00	125.00
26	.....	130.00	26	.....	130.00
27	.....	135.00	27	.....	135.00
28	.....	140.00	28	.....	140.00
29	.....	145.00	29	.....	145.00
30	.....	150.00	30	.....	150.00
31	.....	155.00	31	.....	155.00
32	.....	160.00	32	.....	160.00
33	.....	165.00	33	.....	165.00
34	.....	170.00	34	.....	170.00
35	.....	175.00	35	.....	175.00

Neponset River.—The pilotage for the several landing places in the towns of Dorchester and Neponset shall not be compulsory. When the services of a pilot are required, the rates of pilotage authorized by the commissioners shall be one dollar per foot on inward draft. Outward vessels without cargo, $5.00 per vessel; with cargo, same as inward.

Hingham, East Weymouth, Quincy, Quincy Point, Weymouth, East Braintree, and Nantasket.—The pilotage for the above places shall not be compulsory. When the services of a pilot are required, and are offered outside of a line drawn from Nantasket Point to the east point of Pettick's Island, from thence a line drawn to the northwest point of said Pettick's Island, from thence in a line to Sunk Island, from Sunk Island in a direct line to Hangman's Island, the rates of pilotage authorized by the commissioners shall be, viz:

1869.			1869.			1901.		
East Weymouth.			Quincy Point.			Hingham.		
Draft of water	Rate per foot.	Amount.	Draft of water.	Rate per foot.	Amount.	Draft of water.	Rate per foot.	Amount.
Feet.			*Feet.*			*Feet.*		
7	$0.88	$6.16	7	$0.72	$5.04	7	$0.92	$6.44
8	.90	7.20	8	.72	5.76	8	.95	7.60
9	.92	8.28	9	.72	6.48	9	.97	8.70
10	.93	9.30	10	.80	8.00	10	1.00	10.00
11	.99	10 89	11	.92	10.12	11	1.00	11.00
12	1.10	13.20	12	1.00	12.00	12	1.10	13.20
13	1.25	16.25	13	1.25	16.25	13	1.25	16.25
14	1.40	19 60	14					
15	1.50	22.50	15					
16	1.60	25.60	16					
17	1.70	28.90	17					
18	1.80	32.40	18					

Nantasket, Quincy, Weymouth Landing, and Braintree, same rates as East Weymouth. Inward and outward rates the same.

Lynn.—The pilotage for the harbor of Lynn shall not be compulsory. The rates of pilotage authorized by the commissioners, 1865, shall be, viz:

To Lynn on vessels drawing 12 feet of water, or less, $4.20 per vessel.

To West Lynn, $4.20 per vessel. Up the river through bridges, $5.60 per vessel.

The outward rates shall be one-half the inward rates.

Extracts from the acts of 1862 except where otherwise indicated by marginal references in parentheses.

SOUTH SHORE.

Rates west from certain line to places named established.

The rates for piloting from west of a line drawn from Sakonnet Point to No Mans Land, to the ports herein named, shall be as follows, viz: Into Tarpaulin Cove, one dollar and fifty cents per foot; * * * Falmouth Port, and Holmes Hole, one dollar and seventy-five cents per foot. Into Edgartown and Hyannis, two dollars per foot; and to the bar of Nantucket Harbor, two dollars and twenty-five cents per foot. And into any other ports on the south coast of Barnstable County or on the Vineyard Sound, one dollar and seventy-five cents per foot.

Outward rates from said ports, etc.

The outward rates of pilotage from all of the above-named ports and from the bar of Nantucket Harbor, if taken westward past Gay Head, shall be three-fourths of the above; and the outward and inward rates shall be increased by twenty per cent for all piloting done between the first day of November and the thirtieth day of April, inclusive.

Rates east of said line to said ports, etc.

The rates for piloting vessels into any of the above-named ports, and to the bar of Nantucket Harbor, from any point east of a line drawn from Sakonnet Point to No Mans Land, and between said line and a line drawn due south from Tarpaulin Cove Lighthouse, shall be twenty-five per cent less than the above-named rates; and if said pilot is taken east of line drawn due south from Tarpaulin Cove Lighthouse, fifty per cent shall be deducted from said specified rates; and in case the master then declines taking a pilot, said pilot offering shall be entitled to one-quarter pilotage, agreeably to these regulations; and if no pilot shall have offered his services before passing a line drawn from the West Chop Lighthouse to the Nobska Lighthouse, there shall be no obligation on the part of the master or owner to pay pilotage if the master shall then decline receiving a pilot.

Vessels from eastward to same ports, etc.

The rates of pilotage for vessels coming from the eastward, bound to the aforesaid ports, shall be from east of a line drawn due north from Nantucket Great Point Lighthouse to the bar of Nantucket, one dollar and fifty cents per foot of said vessel's draught. Into Edgartown and Hyannis, one dollar and seventy-five cents per foot. Into Holmes Hole and Falmouth Port, * * * two dollars per foot; and into all other ports on the south coast of Barnstable County or on the Vineyard Sound, one dollar and seventy-five cents per foot; and from west of said line drawn due north from Great Point Lighthouse, twenty-five per cent less than the foregoing. The outward rates, when passing to sea to eastward of Nantucket Shoals, shall be three-fourths of the inward rates, and both outward and inward rates shall be increased by twenty-five per cent for all pilotage done between the first of November and the thirtieth of April, inclusive.

* * * * * * * *

Pilotage of vessels in and out of Woods Holl Harbor. (Chap. 275, act of 1889.)

Sec. 1. The rates for pilotage for vessels in and out of Woods Holl Harbor shall be as follows: Whenever a pilot shall take charge of a vessel bound into said port from sea, east of a line drawn from Sakonnet Point to No Mans Land, the fees shall be two dollars and twenty-five cents a foot of the vessel's draught. If said vessel takes a pilot east of a line drawn due south from Tarpaulin Cove Lighthouse the fees for pilotage shall be one dollar and twenty-five cents a foot of the vessel's draught. For all pilotage done between the first day of November and the thirtieth day of April twenty-five cents a foot additional shall be charged as winter rates. The outward pilotage from Woods Holl for vessels bound west shall be one dollar and twenty-five cents a foot of the vessel's draught to a line drawn due north from Gay Head Lighthouse. When the pilot is taken east of a line drawn due north from Great Point Lighthouse the fee shall be two dollars and twenty-five cents of the vessel's draught. When the pilot takes charge of a vessel west of a line drawn due north from Nantucket Great Point Lighthouse, bound into Woods Holl, the fee shall be one dollar and twenty-five cents a foot of

the vessel's draught; all outward bound vessels from Woods Holl, when bound east over Nantucket Shoals, when taken past and over said shoals, shall be subject to the full fees of two dollars and twenty-five cents a foot of the vessel's draught.

NANTUCKET AND VINEYARD SOUNDS AND BUZZARDS BAY.

Rates.

The rates for piloting vessels through the Vineyard Sound over Nantucket Shoal into Boston Bay, or to any port of destination eastward thereof, if the pilot be taken westward of a line drawn due south from Tarpaulin Cove Lighthouse, or between said line and a line drawn from No Mans Land to Sakonnet Point, from the first day of November to the thirtieth day of April, inclusive, shall be for vessels not drawing more than eleven feet of water, three dollars and fifty cents per foot; if drawing more than eleven feet of water and not more than fourteen feet, four dollars per foot; if drawing more than fourteen feet, four dollars and fifty cents per foot. And from the first day of May to the thirty-first day of October, inclusive, for vessels drawing not more than eleven feet of water, two dollars and fifty cents per foot; if drawing more than eleven feet and not more than fourteen feet, three dollars per foot; if drawing more than fourteen feet, three dollars and fifty cents per foot. And if the pilot be taken west of said line drawn from Sakonnet Point to No Mans Land, ten per cent shall be added to the above specified rates; and if said pilot be taken at any point east of said line drawn due south from Tarpaulin Cove Lighthouse, ten per cent shall be deducted from said rates; and if, during the navigation aforesaid, the pilot is detained in any port at the request of the master, commander, or owner of said vessel, and not from stress of weather, he shall be allowed three dollars per day for all such detention; and in all cases five dollars shall be added to the rates aforesaid if the vessel shall be taken to a port of destination east of Cape Ann and not eastward of Portsmouth; and if the port of destination be Portsmouth or eastward thereof, ten dollars shall be added to said rates; *provided, however*, that any other rates may be agreed upon, by written contract between the master, commander, or owner of any vessel to be piloted, and the pilot taking charge of the vessel.

Vineyard Sound rates.

The rates of pilotage from one port to another on the Vineyard Sound, including the south coast of Barnstable County, and from the said ports to the bar of Nantucket Harbor, and *vice versa*, shall be uniformly one dollar and twenty-five cents per foot, and twenty-five per cent additional for all pilotage done between the first day of November and the thirtieth day of April, inclusive; and for pilotage inward or outward over the bar of Nantucket Harbor only, at all seasons of the year, one dollar per foot.

Nantucket Shoals, authority of pilot.

Any person holding a commission as pilot for Nantucket Shoals, is authorized to pilot vessels from any part of the Vineyard Sound, Nantucket Shoals, and ports bordering on the waters of the same, to the harbor pilot's limits of any port in Buzzards Bay, or ports west of said bay, at the following rates of pilotage: From any point east of a line drawn due north from Cape Poge, at two dollars per foot of such vessel's draught, and if taken westward of said line drawn due north from Cape Poge, one dollar and fifty cents per foot; and if no port pilot offers his services, with the consent of the master, they may proceed with said vessel to her destination and claim the whole amount of pilotage; *provided, however*, that no vessel passing through the waters of the Vineyard Sound, or over the Nantucket Shoals to ports beyond them, shall be holden to pay compulsory pilotage. But in no case shall an unauthorized pilot take charge of any vessel when a commissioned pilot can be obtained at a proper time. Pilots holding commissions for Vineyard Sound and Nantucket Shoals, who may have piloted a vessel over said shoals whose destination is a port in Barnstable or Boston Bay, or eastward thereof, on arrival at the port of her destination, and no harbor pilot offering his services, may, with the consent of the master (but not otherwise), pilot such vessel into her port of destination and receive the regular port pilot fees therefor.

Proviso.

NEW BEDFORD AND FAIRHAVEN.

Authority of pilots.

Pilots especially commissioned for the purpose shall be authorized to pilot vessels from sea, which are bound into the ports of New Bedford and Fairhaven, to abreast of Clark Point Lighthouse, and to the port pilot limits of other ports in Buzzards Bay (or westward thereof), and if no port pilot offers

his services, they may, with the consent of the master or owner, proceed with such vessel to her port of destination, and claim the full amount of pilotage.

Rates.

The rates of pilotage from sea from vessels bound into the ports of New Bedford and Fairhaven to abreast of Clark Point Lighthouse shall be one dollar and ninety cents per foot, and from abreast of Clark Point Lighthouse to the inner harbors of New Bedford and Fairhaven, thirty-five cents per foot, and twenty per cent additional to the sea or bay pilotage, from the first day of November to the thirtieth day of April, when a pilot offers his services or is taken west of a line drawn from Sakonnet Point to the south point of No Mans Land.

The outward rates of pilotage from the ports of New Bedford and Fairhaven to abreast of Clark Point Lighthouse shall be thirty-five cents per foot; from abreast of Clark Point Lighthouse to sea, one dollar and fifty cents per foot.

Vessels to other ports in bay, exemption defined.

Vessels bound into other ports (than New Bedford and Fairhaven) in Buzzards Bay, and ports west of said bay, are exempt from paying compulsory bay pilotage, when coming from sea, from westward to the port pilot limits of the several ports; but if a pilot is employed, he shall be entitled to receive two dollars per foot, and if no port pilot offers his services, he may, with the consent of the master or owner, conduct said vessel to the port of her destination and claim the whole amount of pilotage.

Harbor pilotage in bay, except, etc., rates.

The rates of port or harbor pilotage for all the different ports bordering on Buzzards Bay, and to the westward thereof, excepting New Bedford and Fairhaven, shall be for vessels inward bound, drawing less than twelve feet of water, one dollar per foot; for those drawing from twelve to fifteen feet of water, inclusive, one dollar and thirty cents per foot; for those drawing more than fifteen and not more than eighteen feet of water, two dollars per foot; and for those drawing over eighteen feet of water, two dollars and fifty cents per foot; and the rates of pilotage for vessels outward bound from said ports shall be three-quarters of said inward rates, and both outward and inward rates shall be increased by twenty per cent for all pilotage done between the first day of November and the thirtieth of April, inclusive.

NEWBURYPORT, MERRIMACK RIVER AND HARBORS, ROCKPORT, LANES COVE, AND ANNISQUAM, GLOUCESTER, SALEM AND BEVERLY, MARBLEHEAD, COHASSET, PLYMOUTH, PROVINCETOWN, TAUNTON RIVER.

Newburyport.

Newburyport.—The rates of pilotage for vessels liable to pay pilotage bound into or out of the harbor of Newburyport shall be, for outward bound vessels, from seven to twelve feet draught of water, sixty-five cents per foot; from twelve to fifteen feet, inclusive, eighty-five cents per foot; upwards of fifteen feet, one dollar and five cents per foot. The summer rates of pilotage for inward bound vessels, drawing from seven to under twelve feet, ninety-five cents per foot; from twelve to fifteen feet, inclusive, one dollar and twenty-five cents per foot; over fifteen feet, one dollar and sixty cents per foot. The winter rates of pilotage for inward bound vessels, drawing from seven to twelve feet of water, one dollar and twenty-five cents per foot; from twelve to fifteen feet, inclusive, one dollar and sixty-five cents per foot; over fifteen feet, two dollars and ten cents per foot.

Limits of district.

The district limits of the port of Newburyport shall be from Chebacco Bar, on the south, to the Isles of Shoals, on the north. Vessels not spoken until within the bar shall pay only half pilotage; if not spoken until within the Black Rocks shall pay no compulsory pilotage.

Boats.

The pilots of Newburyport will be required to keep one or more * * * boats, and one boat shall be upon the cruising ground at all times, when the weather will permit.

Merrimack River and Harbors.

Merrimack River and Harbors.—The pilotage on the Merrimack River, between Newburyport and Haverhill, shall not be compulsory. When the services of a pilot are required, the rates of pilotage authorized by the commissioners shall be, between Newburyport and ship-yards at Bellville, thirty cents per foot; between Newburyport and Salisbury, fifty cents per foot; between Newburyport and Amesbury, sixty-two and one-half cents per foot; between Newburyport and Groveland, eighty-seven and one-half cents per foot; between Newburyport and Haverhill, one dollar per foot.

Rockport, Lanes Cove, and Annisquam.

Rockport, Lanes Cove, and Annisquam.—The rates of pilotage shall be, for vessels under twelve feet draught of water, seventy-five cents per foot; of

twelve to fifteen feet, inclusive, one dollar per foot; over fifteen feet, one dollar and fifty cents per foot. The inward and outward rates shall be the same.

Rates for pilotage into Gloucester Harbor. (Chap. 228, acts of 1873.)

Gloucester.—Sec. 1. The rates of pilotage for vessels liable to pay pilotage bound into the harbor of Gloucester, shall be for vessels drawing seven feet and less than twelve feet, one dollar and fifty cents per foot; for those drawing twelve feet and upwards, the same as for the ports of Salem and Beverly.

Salem and Beverly.

Salem and Beverly.—The pilots for the ports of Salem and Beverly shall keep one or more good decked boats, and shall cruise for the purpose of bringing vessels into said ports whenever the weather does not render it impracticable.

The harbor lines of the ports of Salem and Beverly shall be a line running north by east from Half-Way Rock to the northern shore, and a line running northwesterly from Half-Way Rock to Marblehead Fort, within which lines there shall be no compulsory inward pilotage. The rules for pilotage, both for inward and outward bound vessels, shall be as follows, viz: * * *

Rates of pilotage for ports of Salem and Beverly to be same as for Boston. (Chap. 204, Supp. to P. S.)

Sec. 1. The rates of pilotage for the ports of Salem and Beverly shall hereafter be the same as those established for outward and inward bound vessels for the port of Boston.

* * * Any Salem and Beverly pilot, having brought a vessel in, shall have such vessel properly moored in the harbor or secured at the wharf, at the option of the master, within twelve hours after the arrival of said vessel, if the weather permits, without extra charge; but if called upon after the expiration of the twelve hours to haul any vessel into the wharf, the pilot shall be entitled to receive two dollars for his services, and the same sum for taking a vessel from the wharf into the harbor, if said vessel shall not proceed to sea within twelve hours from the time of her being anchored in the harbor. The signal for the pilot boats for the ports of Salem and Beverly shall be their accustomed signal by day, viz, a red flag with a white P, and a black ball painted on the upper part of mainsail and jib; and by night a green light.

Marblehead.

Marblehead.—The rates of pilotage for vessels liable to pay pilotage bound into the harbor of Marblehead shall be, for vessels drawing from seven to eleven feet of water, sixty-seven cents per foot; from twelve to fourteen feet, ninety cents per foot; from fifteen to seventeen feet, one dollar and twenty cents per foot; eighteen feet and upwards, one dollar and sixty cents per foot.

The harbor limits of Marblehead shall be bounded by a line drawn from the south point of the Neck to Marblehead Rock, thence to Cat Island Rock, and thence westerly to Gerrys Island; within this line there shall be no compulsory inward pilotage. The outward rates shall be the same as the inward.

Pilot for Cohasset Harbor. (Chap. 298, Supp. to P. S., Sec. 2.)

Cohasset Harbor.—The rates of pilotage for said harbor shall be the same for outward and inward bound vessels as those established for the harbor of Boston.

Plymouth.

Plymouth.—The rates of pilotage for vessels liable to pay pilotage bound into the harbor of Plymouth shall be one dollar per foot. Vessels arriving inside of the Gurnet, and no pilot previously offering his services, are exempt from compulsory pilotage, if a pilot's services are then refused. Rate of pilotage outward, seventy-five cents per foot.

Bay and harbor pilots, six; appointment and duties.

Provincetown.—There shall be commissioned from the port of Provincetown not more than six persons, who shall be competent as bay and harbor pilots, and who shall keep a * * * boat, * * * and shall cruise in all seasons, for the purpose of taking vessels into Provincetown or Cape Cod Harbor. Said pilots shall also be entitled to take vessels, when outside the limits of the line hereinafter defined, to or within said limits, or until spoken by a Boston pilot. Vessels bound into the port of Boston, and liable to pay pilotage, will take such pilots, when first spoken by them, and said pilots shall have authority to pilot any such vessels until spoken by a Boston pilot, when the vessel shall be given up to the first pilot commissioned for the port of Boston who may hail her; but the cape pilot shall continue on board until relieved by a Boston pilot, to whom the vessel shall be given up; and the pilotage of such vessel shall be divided between the two pilots, *pro rata*, in proportion to the distance each may have charge of her, after passing a line drawn from Plymouth Lights to Thacher Island, Cape Ann, in which event distance-money shall be wholly for the benefit of the cape pilots—otherwise for the Boston

pilots; but the compensation of the first pilot shall in no case be less than five dollars, which amount shall be deducted from the regular pilotage, so that in no instance shall there be any addition to the usual rates of pilotage in consequence of taking such cape pilots.

Cape Cod and Provincetown pilots.

The limits outside of which such Cape Cod or Provincetown pilots may take a vessel bound into Boston shall be a line drawn northeast from the Gurnet or Plymouth Lights; but all commissioned pilots for the port of Boston shall have the privilege of cruising outside of said line, as heretofore.

Vessels via cape, for Salem, etc.

Vessels coming by Cape Cod and bound for the ports of Salem, Beverly, or Marblehead, who may desire the services of a cape pilot, may take such pilot as may be competent, to the several ports or pilots, under the same restrictions as are provided for vessels bound to Boston, as above.

Rates for vessels bound to Provincetown, taken south of line west from Race Point.

The rates of pilotage for all vessels liable to pay pilotage bound into the harbor of Provincetown, if taken south of a line drawn due west from Race Point Lighthouse, or between that and a line drawn due south from Wood End Bar, shall be for vessels drawing less than twelve feet of water, one dollar per foot; for those drawing from twelve to fifteen feet of water, inclusive, one dollar and thirty cents per foot; for those drawing more than fifteen feet and not more than eighteen feet of water, two dollars per foot; for those drawing more than eighteen feet and not more than twenty-one feet of water, two dollars and fifty cents per foot; for those drawing more than twenty-one feet and not more than twenty-five feet of water, three dollars and fifty cents per foot, and no more. But no vessel shall be liable to pay compulsory pilotage if the services of a pilot are refused after passing a line drawn due south from Wood End Bar. And the outward rates of pilotage shall be three-fourths the amount of said inward rates.

Taunton River.

Taunton River.—The pilotage for Taunton River shall not be compulsory. When the services of a pilot are required, the rates of pilotage on all vessels piloted from Fall River to Somerset, drawing not over twenty feet of water, is two dollars. From Fall River to Dighton, on vessels drawing twelve feet of water, seven dollars; eleven feet, six dollars and fifty cents; ten feet, six dollars; nine feet, five dollars and fifty cents; eight feet, five dollars; under eight feet, four dollars. From Somerset to Dighton and Berkley, fifty cents per foot for vessels drawing from eight to twelve feet of water; under eight feet, three dollars per vessel. The downward pilotage from the aforesaid places shall be one-half of the upward rates.

HARBOR CONTROL.

Extracts from Chapter 66 of the Revised Laws of Massachusetts, 1902.

Penalty for boarding vessels without leave.

Sec. 1. Whoever, not being a pilot or public officer, boards or attempts to board a vessel arriving in the harbor of Boston, Salem, Fall River, New Bedford and Fairhaven, or Gloucester, before such vessel has been made fast to the wharf, without the previous permission of the master or person having charge thereof or the previous permission in writing of its owners or agents, or whoever, without such leave and without authority of law, boards a vessel in any of said harbors after having been forbidden so to do by a person having charge thereof at the time, or, having boarded such vessel, refuses or neglects to leave it when ordered so to do by the person having charge of it, shall forfeit not more than fifty dollars for each offense.

Harbor limits.

Sec. 6. For the purpose of the five preceding sections, the outer limits of Boston harbor shall be a line drawn from Harding's Rock to the Outer Graves and from thence to Nahant Head, and said harbor shall include the shores of Chelsea; the outer limits of Salem harbor shall be the chops of said harbor; the harbor of Fall River shall include the waters of Taunton Great River and Mount Hope Bay, from the south line of the town of Freetown to Rhode Island state line, including the shores of Somerset; the harbors of New Bedford and Fairhaven shall be considered one harbor, the outer limits of which shall be the outer limits of Buzzards' Bay; and the outer limits of Gloucester harbor shall be a line drawn from Eastern Point to Norman's Woe.

Stones, etc., not to be deposited in harbor.

Sec. 17. Whoever wilfully and without lawful authority or license therefor, deposits in a harbor or other navigable tide waters stones, gravel, mud, ballast, cinders, ashes, dirt or any other substance tending to injure the navigation or to shoal the depth thereof shall be punished by a fine of not more than twenty dollars for each offense.

No line to be passed across channel.

Sec. 18. No warp or line shall be passed across a channel or dock so as to obstruct vessels passing along the same.

Powers of harbor masters.

Sec. 21. The master of a vessel within a harbor for which a harbor master is appointed shall anchor his vessel according to the regulations of the harbor master, and shall move to such place as the harbor master directs. The master of a towboat having a vessel in tow and a pilot having a vessel in charge shall allow such vessel to anchor only in such place as the regulations of the harbor master provide for anchorage.

Powers of harbor masters.

Sec. 22. The master of a vessel, before unloading lumber in the stream or channel of a harbor having a harbor master, shall obtain from him a permit, designating where such lumber may be rafted.

Powers of harbor masters.

Sec. 23. A vessel lying in a harbor or at a wharf or pier in a harbor shall, if so directed by the harbor master, cockbill the lower yards, brace the topsail yards fore and aft and rig in the jib-boom.

Removal of vessel lying in harbor.

Sec. 24. A harbor master may, at the expense of the masters or owners thereof, cause the removal of any vessel which lies in his harbor and is not moved when directed by him, and upon the neglect or refusal of such master or owner on demand to pay such expense, he may recover the same from them in an action of contract, to the use of the city or town in which the harbor is situated.

—of vessel lying at wharf.

Sec. 25. If the master or other person in charge of a vessel occupying a berth at a wharf or pier fails, after notice from the wharfinger thereof or his agent, to remove his vessel from such berth within such time as the harbor master adjudges reasonable, the harbor master shall cause such vessel to be moved to some other berth or anchored in the stream, and may recover the expense of such removal * * * from the master or owners. * * *

Regulation of station of vessels, etc.

Sec. 26. A harbor master may, in the harbor for which he is appointed, regulate and station all vessels in the streams or channels thereof, and may remove such as he determines are not fairly and actually employed in receiving or discharging their cargoes, to make room for such others as require to be more immediately accommodated for such purposes.

Penalty for violating preceding sections.

Sec. 28. Whoever violates any of the provisions of the ten preceding sections or refuses or neglects to obey the lawful orders of a harbor master, or resists him in the execution of his duties, shall be punished by a fine of not more than fifty dollars, and shall be liable in an action of tort to any person suffering damage thereby.

GLOUCESTER HARBOR.

Extracts from chapter 315, acts of 1885.

Harbor master to be appointed.

Sec. 1. That the mayor and aldermen of the city of Gloucester may * * * appoint a harbor master for the harbor of said city. * * *

May appoint deputy.

He may appoint a deputy whenever the mayor and alderman deem it necessary. * * * He and his said deputy shall have the powers and duties, and shall enforce the regulations and penalties set forth in the last twelve sections of chapter sixty-nine of the Public Statutes, and in this act, and in any other laws which are or may be in force applicable to said office and to said harbor. * * *

Certain passageway to be kept open.

Sec. 2. From Tenpound Island to Fivepound Island, a sufficient passageway of not less than two hundred feet in width on the northerly side of said harbor, leaving Babson Ledge buoy on the port hand going in and a passageway of not less than one hundred and fifty feet in width from any wharf in Upper Cove, Smiths Cove, and Harbor Cove in said harbor, shall be at all times kept open for the passageway of vessels; and no vessel shall be anchored or allowed to lie at anchor in said passageways or in the track of the ferryboats regularly running in said harbor. .

A man to be on board each vessel; light, etc.

Sec. 3. At least one man shall at all times be kept on board each vessel at anchor in said harbor; and a clear and distinct light shall be kept suspended not less than six feet above the deck of every such vessel during the night.

BOSTON HARBOR.

Extracts from the statutes.

Sec. 1. No vessel which shall cast anchor in the harbor of Boston, between India Wharf and Grays Wharf, shall anchor within five hundred feet of the line described in the second section of an act entitled "An act to preserve the harbor of Boston, and to prevent encroachments therein," passed on the nineteenth day of April, in the year one thousand eight hundred and thirty-seven; and no vessel which shall cast anchor between the easterly side of Lamsons Wharf and the easterly side of Tuttles Wharf, at East Boston, shall anchor within five hundred feet of the line described in the fifth section of "An act concerning the harbor of Boston," passed the seventeenth day of March, in the year one thousand eight hundred and forty, unless for the purpose of hauling in, as soon as practicable, to some wharf in said harbor, or unless compelled to do so by reason of stressof weather or unavoidable casualty. * * *

Anchorage to be only within certain limits. (Chap. 234, acts of 1847.)

Provided, etc.

Sec. 4. All vessels at anchor in the harbor of Boston shall keep an anchor watch at all times, and shall keep a clear and distinct light, suspended at least six feet above the deck, during the night. * * *

Concerning anchor watch and lights at night. (Chap. 314, acts of 1848.)

Sec. 1. No vessel propelled by steam shall, either in Boston Harbor or Charlestown Harbor, pass within one hundred yards of any wharf at greater speed than at the rate of five miles an hour.

Steam vessels not to pass wharves faster than five miles an hour. (Chap. 16, acts of 1872.)

Extracts from a pamphlet edition of the Rules and Regulations of the Harbor Master, 1901.

1. All vessels anchoring on the south side of the channel shall anchor within the following marks, viz:

The Twin Towers of St. Mary's Church on Thacher street in range with granite block on Long Wharf and south-east of a line drawn between the Elevators in East and South Boston.

2. All vessels anchoring on the north side of the channel shall anchor within the following marks, viz:

Long Island Light-house in range with the Half Moon Battery on Governor's Island, and south-east of a line drawn between the Elevators in East and South Boston.

3. All vessels of light draft shall anchor inside the above ranges in order that sufficient room may be given to vessels of deep draft.

4. No vessels shall lie at anchor in the tracks of the Ferry-boats, nor in Fort Point Channel.

5. No more than two vessels at a time shall anchor, nor make fast to any that are anchored, between the East Boston North and South Ferries.

6. All light vessels shall anchor south-east of a line drawn between the Boston, Revere Beach & Lynn Railroad Ferry in East Boston and the New Commonwealth Pier in South Boston.

7. No vessel shall anchor in the dredged channel to the Metropolitan Coal Company's Wharf, at South Boston.

8. A master of a vessel, before discharging or loading any cargo within the anchorage limits, shall obtain a permit from the Harbor Master, and have a berth assigned him.

9. Yachts anchoring on the Yacht Anchorage, off Rowe's Wharf, shall anchor by the following marks:

The Round Chimney on Cold Storage building on Richmond street, between Commercial street and Atlantic avenue, in range with east end of granite block on Long Wharf; to westward of the mouth of the State Dock; the flagstaff on freight house No. 2, New York & New England Railroad (in Fort Point Channel), in range with northerly side of the Atlas Stores building in South Boston; and not less than 500 feet from the New York & New England Railroad Wharf.

QUARANTINE.

Extract from Chapter 75 of the Revised Laws of Massachusetts, 1902.

Town may establish a quarantine ground.

Sec. 131. A town may establish a quarantine ground in a suitable place * * *

Quarantine of vessels.

Sec. 132. The board of health in a seaport town may from time to time establish the quarantine to be performed by vessels arriving within its harbor, and may make quarantine regulations for the health and safety of the inhabitants, * * *

Quarantine of suspected vessels.

Sec. 133. Such board may at any time cause a vessel arriving in port, if such vessel or the cargo is, in its opinion, foul or infected so as to endanger the public health, to be removed to the quarantine ground and thoroughly purified at the expense of the owners, consignees, or persons in possession of the same; and may cause all persons arriving in or for any purpose visiting such vessel, or handling the cargo, to be removed to any hospital under the care of the board, there to remain under its orders.

Penalty for refusal to answer on oath.

Sec. 134. Any person belonging to or arriving in a vessel on board of which any infection then is or has lately been, or is suspected to have been, or which has been at or has come from a port where an infectious distemper prevails which may endanger the public health, who refuses to make answer on oath, to be administered by any member of the board, to questions relating to such infection or distemper asked by the board of health of the town to which such vessel may come shall forfeit not more than two hundred dollars.

Quarantine expenses, how paid.

Sec. 135. All expenses incurred on account of any person, vessel, or goods which are under quarantine regulations shall be paid by the owner of such vessel.

GLOUCESTER HARBOR.

Extract from a pamphlet edition of the Regulations of the Board of Health, 1897.

Reg. 32. Every vessel entering the Harbor of Gloucester from any sickly port, or having any case of contagious or doubtful disease on board, or on board of which any person shall have died of any contagious or doubtful disease, shall be brought to anchor in that part of the harbor between Ten Pound Island and Eastern Point, and shall immediately display a yellow flag at the head of the foremast, which shall be kept flying so long as said vessel shall be at anchor in said place.

SALEM HARBOR.

Extracts from a pamphlet edition of the Regulations of the Board of Health, 1897.

Reg. 51. From the first day of April in any year to the first day of January next following, all vessels arriving in this harbor from any foreign port or from any port south of Virginia, and also vessels arriving from any place in the United States where they may have touched on their way from any foreign port or place above named, shall come to and stop at the quarantine ground in said harbor.

Reg. 54. No vessel arriving in said harbor from the ports aforesaid shall leave the quarantine ground until the examination provided by said regulation 53 shall have been fully completed, nor without a written permit from the board of health or its said agent.

Reg. 56. While a vessel remains at the quarantine ground its cargo shall not be handled nor shall anything whatsoever be removed from such vessel; nor shall any person or persons go on board or leave the same without the permission of the board of health or its said agent. Every vessel while at the quarantine ground shall constantly keep hoisted a yellow flag, not less than three feet in length and two feet in width.

Reg. 57. For any permit granted under regulation 54 or 55, the said clerk shall have the right to demand and receive from each vessel, her masters or owners, the fee established by the board of health.

BOSTON HARBOR.

Extracts from a pamphlet edition of the Quarantine Regulations, in force 1902.

ORDERED, That any vessel arriving at this port, which has on board at the time of her arrival, or has had during her passage to this port, any sickness of a contagious, infectious, or doubtful character which may be dangerous to the public health, or which has come from or has been in any port or place which has been epidemically infected with any contagious

or infectious disease within the six months next preceding such arrival, or has on board any merchandise which has come by transhipment from any such infected port or place within the six months next preceding, or has on board any immigrants (except from British America) shall be anchored at Quarantine.

All old rags, paper stock, hair, feathers, hides, skins, wool, and similar materials which are liable to convey disease germs must be accompanied by satisfactory certificates as to their place of collection and packing for shipment.

No article of clothing or bedding in use shall be thrown overboard from any vessel in Boston Harbor without the written consent of the Board of Health or the Quarantine Physician; nor shall any such article be removed from any vessel at her dock without such permission; all such articles which are to be destroyed, shall be burned in the harbor under the supervision of the Quarantine Physician, in the furnaces of the steamers.

No vessel shall leave Quarantine, nor shall her cargo, or any part thereof, be discharged, nor any person be allowed to go on board or to leave her while in Quarantine, without the written permit of the Port Physician, who is hereby authorized and instructed to take such measures with regard to said vessel, cargo, and persons, as, in his judgment, the public health may require.

It is also hereby ordered, that during June, July, August, September, and October of each year, subject to such changes as circumstances may from time to time require, all vessels arriving in this harbor from the following ports shall stop at the Quarantine Station, viz: all vessels from any port in Europe, from the Western, Madeira, Canary, or Cape de Verde Islands; from the Mediterranean or Straits thereof; from the west coast of Africa, or around the Cape of Good Hope; from the West India, Bahama, or Bermuda Islands; from any American port south of Virginia, including Central and South America; and vessels arriving from any place in the United States or British America, where they may have touched on their way from any foreign port or place above named.

No such vessel shall leave Quarantine or unload her cargo or any part thereof, nor shall any person go on board or leave the vessel while in Quarantine without the written permit of the Port Physician, who is hereby authorized and instructed to take any measures in regard to such vessels as in his judgment the public health may require.

The Port Physician is hereby authorized and instructed to demand and receive the Quarantine fees which are hereby made and established by this Board and which are as follows:

For examination of vessels of five hundred tons and upwards (registration tonnage), eight dollars.

For examination of vessels under five hundred tons (registration tonnage), five dollars.

For disinfecting vessels, from ten to fifty dollars.

For baths and disinfecting personal clothing and baggage, one dollar for each person.

For vaccination, twenty-five cents for each person.

For board of patients in hospital, ten dollars a week.

PROVINCETOWN HARBOR.

Extracts from Quarantine Regulations adopted April 1, 1899, and in force 1902.

1. Quarantine Ground of Provincetown. That portion of the harbor lying without a line drawn due northeast from the eastern extremity of Long Point and eastwardly three-fourths of a mile from Provincetown shore, shall be known as Quarantine grounds.

2. All vessels arriving from or having on board any persons or goods of any description from any foreign port where smallpox, cholera, typhus or ship fever or yellow fever, or any contagious disease is known to be prevailing or has lately been known to have prevailed, are hereby forbidden to cross quarantine line to come into harbor, or to land, within the harbor or limits of this town, any person whether of crew or passenger, or any goods, personal effects, or merchandise as aforenamed, until so permitted by the Board of Health after due inspection, or approval of the bill of health by said Board. Such vessel may however put to sea in preference to going into quarantine provided there be no infection aboard in which latter condition they will be subject to Regulation 3.

3. Any vessel having on board a case of any of the above named diseases shall immediately take a position upon Quarantine grounds, and shall there remain under the special supervision of the Board of Health until discharged by them, which will not be until after proper disinfection of the said vessel, crew and cargo. No persons, nor any goods, personal effects, or merchandise, shall be landed from any vessel in quarantine; nor shall any person visiting such vessel again land until the vessel's quarantine is finished, except by a permit from the Board of Health. Filthy or unclean vessels shall be subject to quarantine for purposes of purification. All vessels liable to quarantine shall discharge in quarantine and be detained thereafter for necessary purification.

8. A fee of five dollars shall be charged each vessel inspected by the Health officers and fifty cents addition for each passenger. All vessels arriving from foreign ports shall be subject to inspection during every month of the year, and all vessels from domestic ports south of Hatteras from April first to November first inclusive.

NEW BEDFORD HARBOR.

Extracts from the Quarantine Regulations in the annual report of the Board of Health, 1893.

1. Every vessel arriving from a foreign port shall immediately proceed to the quarantine grounds, and shall be visited by the quarantine officer between sunrise and sunset as soon as possible after such arrival. Such officer shall examine the bill of health, and shall inspect the vessel. * * *

2. * * * And it shall be the duty of the Board of Health to provide a suitable number of yellow flags, and whenever any vessel or vessels shall be ordered to the quarantine grounds for purification, the master of said vessel shall hoist one of said flags at the head of the mainmast, there to be kept during the daytime, so long as said vessels shall remain at quarantine.

5. * * * A quarantine shall be had of all vessels, their officers and crews, passengers and cargoes that come within the harbor of New Bedford, on board of which any person shall have died or been sick of any contagious or infectious disease during the passage to New Bedford, or which are foul or infected after their arrival, or which are from, or have brought their present cargo or any part thereof from any port or place where any infectious or contagious disease prevails, or recently has prevailed. * * *

6. The quarantine shall be had and performed at an anchorage ground south of the Eleven Foot bank, under the direction of the quarantine physician; and shall continue on every such vessel, until the master shall receive a certificate from the said physician, that he may be discharged. Provided, however, that in case of unreasonable delay by the quarantine physician to grant such certificate, the owner, agent, or consignee of such vessel, or any part of her cargo, may apply to the Board of Health, who may on being satisfied of the propriety of discharging such vessel from quarantine, issue such certificate.

7. The master of every vessel discharged from quarantine shall, within twenty-four hours after such discharge, deliver at the Board of Health office the certificate and flag he shall have received of the quarantine physician, and pay into the city treasury the sum of five dollars, for which he shall be entitled to a certificate from the City Clerk to authorize his entry at the customhouse.

8. During the time that such vessel is performing quarantine, no person, without a permit from the quarantine physician, shall go on board thereof, except those employed by or under the quarantine physician, and no person without a permit as aforesaid shall go within a line upon the land adjoining any public hospital, to be designated by the quarantine physician, except as aforesaid.

10. Any person offending against any of these regulations, from the first to the ninth, both inclusive, shall pay a sum not less than three, nor more than twenty dollars; and in addition he shall be liable to all the penalties provided by the laws of the commonwealth in relation to quarantine.

PORT OF FALL RIVER.

Extracts from a pamphlet edition of the Regulations of the Board of Health, 1899.

Reg. 55. All vessels arriving at this port from any port where Asiatic cholera, yellow fever, typhus fever, smallpox or any other contagious disease prevailed at the time of said vessel's sailing therefrom, or having on its arrival, or having had during its voyage any of said diseases on board, shall anchor southerly from the "Lighthouse on Borden Flats," and not less than two thousand feet westerly from the easterly shore of Mount Hope Bay, at quarantine, and remain there until examined by the City Physician, and pending such examination no person shall be permitted to visit or go on board such vessel, except under the direction of the Board of Health. Such vessels shall only be allowed to come up to the city after such examination, and upon the certificate of said physician that in his opinion the health of the city would not be endangered thereby. The penalty for any violation of this regulation shall be a fine of one hundred dollars.

RHODE ISLAND.

Extracts from the General Laws of the State of Rhode Island and Providence Plantations, 1896.

PILOTS AND PILOTAGE.

CHAPTER 117.

Sec. 3. Every pilot shall take charge of all registered vessels entering the ports or waters of the state, or going out of the same, except fishing vessels not whaling vessels, coastwise vessels, vessels sailing from one port to another within the state and not in completion of a voyage from a place out of the state and passenger steam vessels regulated by United States laws and carrying a United States pilot. Duties of pilots.

Sec. 4. Every vessel inward bound, other than those included in the exception in the preceding section, shall pay to the first pilot offering his services, the regular pilotage fee; but coastwise vessels not taking a pilot shall be exempt therefrom; provided, however, that no vessel shall be obliged to take a pilot or to pay pilotage if she is bound into the harbors of Newport, Bristol or Warren, unless a commissioned pilot shall offer his services before such vessel passes the line from Point Judith to Brenton's Reef light-boat. Vessels liable to pilotage fee, when.

Sec. 5. Every pilot shall have a lien for his pilotage fees, for the space of sixty days, upon the hull and appurtenances of any vessel liable to him therefor. Pilotage fees a lien on vessels.

Sec. 6. Coastwise vessels shall not be required to take a pilot, but if they elect to take a pilot, the pilotage shall be the same as for registered vessels. Coastwise vessels may refuse pilots.

Sec. 9. The commissioners may from time to time make rules and regulations concerning pilots and pilotage and fixing the rates of pilotage, * * * Rules for pilots and pilotage.

Sec. 11. Vessels taking steam towage into or out of a port or harbor of the state by direction of the owner or master shall pay full pilotage; but whenever steam towage is taken by request of the pilot the vessel shall be liable to pay only seventy-five per centum of the rates of pilotage to which such vessel would otherwise be liable. Rates of pilotage for vessels taking steam towage.

Sec. 12. Whoever, not holding a commission as a pilot under the provisions of this chapter, except persons employed on board of the vessel for the voyage, exercises the duties of a pilot on board of any vessel within the waters of the state where a commissioned pilot offers his services or can be obtained at a reasonable time, shall be fined * * *, whether the vessel is liable to compulsory pilotage or not, * * *. Penalty for acting as pilot without being commissioned.

Extracts from pamphlet edition of Laws, By-laws, and Rates of Pilotage, 1892.

RATES OF PILOTAGE FIXED BY THE PILOT COMMISSIONERS.

The rates to all ports in Rhode Island except Newport and Dutch Island are as given in the following table:

Draft.	Rate per foot.	Total.	Draft.	Rate per foot.	Total.	Draft.	Rate per foot.	Total.
7½ feet and under	$1.25	$9.37	11½ feet	$1.75	$20.12	15½ feet	$2.75	$42.62
8 feet	1.50	12.00	12 feet	2.00	24.00	16 feet	3.00	48.00
8½ feet	1.50	12.75	12½ feet	2.00	25.00	16½ feet	3.00	49.50
9 feet	1.50	13.50	13 feet	2.25	29.25	17 feet	3.25	55.25
9½ feet	1.50	14.25	13½ feet	2.25	30.37	17½ feet	3.25	56.87
10 feet	1.75	17.50	14 feet	2.50	35.00	18 feet and over	3.50	63.00
10½ feet	1.75	18.37	14½ feet	2.50	36.25			
11 feet	1.75	19.25	15 feet	2.75	41.25			

The rates to Fall River, Mass., are the same as given above.

To Newport and Dutch Island the rates are as follows: 10 feet draft and under, $1 per foot; 10½ to 12 feet, $1.50 per foot; 12½ to 15 feet, $2 per foot; 15½ to 20 feet, $2.50 per foot; 20½ feet and over, $3 per foot.

The outward rates of pilotage for all ports in Rhode Island are the same as the inward rates.

HALF RATES.

If bound into Wickford and past the range of Fox Island and the Beacon, half the regular rates of pilotage.

If bound to East Greenwich or Apponaug (so called) and past the range of the Beacon and Warwick Neck Lighthouse, half of the regular rates of pilotage.

If bound to Providence and past the line of Warwick Neck Lighthouse and Popposquash Point, half of the regular rates of pilotage.

If bound into Mount Hope Bay and past Sandy Point Lighthouse, half of the regular rates.

WINTER RATES.

From November 1 to May 1, 50 cents per foot extra in addition to the foregoing rates.

No vessel bound to Providence shall be compelled to take a pilot unless spoken by a branch pilot below Nayatt Point; or if bound to East Greenwich or Apponaug, below Warwick Neck and the Spindle; or Mount Hope Bay, below the pyramid at Bristol Ferry.

Pilots shall not charge for less than 4 inches of water, but when a vessel draws 4 inches, then the pilot shall charge for the half foot.

Extracts from the General Laws of the State of Rhode Island and Providence Plantations, 1896.

PROTECTION TO NAVIGATION.

CHAPTER 118.

No cinders shall be thrown from steamboats in certain waters.

Sec. 4. No person shall throw * * * into the waters of Providence river or Seekonk river or Narragansett bay north of a line drawn from Nayatt Point to Rocky Point any cinders or ashes from any steamboat. * * *

Dumping of mud, etc., in Providence river, Warren river, and portions of Narragansett bay forbidden.

Sec. 5. No person shall deposit any mud, earth, sand, gravel, ashes, cinders or other substances in the main channel of Providence river leading to the city of Providence, or in any part of the said river or of Warren river or of Narragansett bay lying east of the said main channel and north of a line drawn east and west across the said channel, and from the easterly line thereof to the eastern shore of the said bay, in the range of the lower buoy off Rumstick Point, or in the waters of Narragansett bay, within one mile of the shores of Bristol county or Hog Island; * * *

QUARANTINE.

CHAPTER 95.

Health officer in seaport towns; his duties and compensation.

Sec. 1. Each seaport town, or the town council thereof, may appoint a health officer.

To designate place of anchorage, define quarantine limits, etc.

Sec. 4. They shall designate the particular place in the harbor, bay or river, adjacent to such town, where all ships or vessels arriving, subject to examination or quarantine, shall come to anchor, and shall define the limits of such quarantine ground, and assign the time for which such ships or vessels shall be detained, and where and how unladen.

Penalty for neglect to anchor.

Sec. 6. Every commander of a ship or vessel who shall * * * refuse or neglect to bring his ship or vessel to anchor within the limits as above described, shall be fined not exceeding five hundred dollars nor less than twenty dollars, to the use of the town.

Penalty for leaving quarantined vessel.

Sec. 8. Every person who shall leave any ship or vessel under order of quarantine, without permission from the health officer or the town council of such town, shall be fined not exceeding twenty dollars; * * *

Of vessels bound to Providence.

Sec. 9. If any vessel shall arrive in the waters of the state, bound to the port of Providence, at any time while the quarantine regulations of the city of Providence are in force, no person on board such vessel shall leave the same until such vessel shall have been visited and examined by the health officer * * *

CHAPTER 94.

Infected vessel not to anchor, where, without license from town council.

Sec. 1. Every commander of any vessel which shall come into any port or harbor of the state, and shall have any person on board sick of the smallpox or any other contagious or infectious distemper, or which has had any person

sick of such distemper during the passage to such port or harbor, or shall come from any port or place usually infected with the smallpox, or where any other contagious or infectious distemper is prevalent, who shall bring such vessel to anchor in any of the ports or harbors of the state within the distance of one mile from any public ferry, pier or landing place, or permit or suffer any person on board such vessel to be landed, or any person to come on board such vessel, without a license first had and obtained from the town council of the town where such vessel shall arrive, shall be fined four hundred dollars.

Penalty.

Sec. 2. Such commander, on his arrival in any of the waters of the state, shall forthwith hoist and keep his colors in the shrouds of such vessel, as a signal that he has come from some such infected place or has infection or contagion on board.

Signals to be kept in shrouds.

Sec. 3. If any person shall come on shore from on board such vessel, without license first had and obtained as aforesaid, the town council may send back such offender immediately on board such vessel, or confine him on shore in such convenient place as to them shall appear most effectual to prevent the spreading of any infection; and the person so offending shall satisfy and pay all charges that shall arise thereon, and shall also be fined forty dollars.

Penalty for leaving such vessel without license.

Sec. 32. The health officer of the city of Newport shall * * * have authority * * * in all matters arising under this chapter in relation to any vessel coming within Dutch Island harbor or within the waters of the East (Sakonnet) river below the bridges between Portsmouth and Tiverton.

Powers of the health officer of Newport.

NEWPORT, R. I.

HARBOR REGULATIONS.

Extracts are from the City Ordinances, 1902.

CHAPTER 17.

Sec. 1. All vessels entering the harbor shall be anchored, by the master or commander thereof, according to the directions of the harbor master.

Vessels entering harbor to be anchored under directions of harbor master.

Sec. 2. All vessels lying in the harbor, not anchored according to the directions of the harbor master, and not having sufficient crew to move them, shall be moved by the harbor master, * * *

Of vessels not so anchored.

Sec. 3. The harbor master shall have authority to remove * * * such vessels as are not employed in receiving or discharging their cargoes, * * * he being sole judge as to the fact of their being fairly or properly employed in receiving or discharging their cargoes; and he also, for any purpose in his discretion, may move or order or cause to be moved any vessel lying anywhere in the harbor, whether at a wharf or elsewhere, * * *

Powers of harbor master.

CHAPTER 39.

Sec. 1. It shall be the duty of the captain or engineer of every ship or boat which is propelled by steam, to cause the speed of his said ship or boat while passing through the inner harbor of said city, between the lighthouse on Goat Island Breakwater and the south end of Goat Island, to be regulated to not exceeding the rate of five miles an hour.

Speed of steamboats in inner harbor not to exceed 5 miles per hour.

QUARANTINE.

CHAPTER 18.

Sec. 1. A quarantine shall be had of all vessels, their officers, crews, passengers, and cargoes that come within the harbor of Newport, which are from any port or place whatever, where any infectious, contagious or malignant disease prevails, or recently has prevailed, or which are foul or infected after their arrival; no vessel coming from any infected district, or on board which, during her voyage, any person may have died of any infectious disease, or whose cargoes or any part thereof has recently been brought from any such port or place, shall be unladen of any article which may be deemed by the health officer capable of generating or communicating disease, until written permission therefor can be obtained from the mayor, * * *

What vessels, etc., subject to quarantine.

The quarantine ground.

Sec. 2. The quarantine ground of the City of Newport shall comprise those portions of the harbor of Newport which lie to the northward of the lighthouse on the breakwater of Goat Island and to the southward of Coasters' Harbor Island, and west of a straight line drawn from said lighthouse to the western part of said Coasters' Harbor Island. * * *

Quarantined vessels to wear colors in shrouds.

All vessels that may be ordered into quarantine shall during the time they remain in quarantine, wear a color in their shrouds in such manner as to be seen at a safe distance.

No one to visit quarantined vessels except, etc.

Sec. 3. During the time any vessel is performing quarantine, no person shall go on board thereof. * * *

Duties of sentinel of quarantine.

Sec. 4. It shall be the duty of the sentinel to board every vessel arriving at this port between the 30th day of June and the 1st day of November of any year, and examine their condition, and if such vessel is liable to quarantine, to order said vessel to the quarantine ground and deliver the captain or commanding officer a copy of these regulations, * * *

Of vessels coming from other quarantine ports.

Sec. 9. All vessels arriving at this port, after having discharged their cargoes in any other port of the United States, agreeably to the quarantine regulations of such port, shall anchor on the quarantine ground, and be visited and examined by the said health officer, and be subject to the provisions of the first section of this chapter, the same as if said vessel came direct to this port.

Powers of inquiry of health officer.

Sec. 12. The said health officer shall have authority to put such interrogatories and inquiries to the captain or commanding officer, or any other person on board of any vessel arriving at this port and subject to quarantine, as he shall deem proper, * * *

PROVIDENCE, R. I.

HARBOR REGULATIONS.

Extracts from a pamphlet edition of the Revised City Ordinances, 1899.

Sec. 1. The harbor master shall have full power and authority to prescribe regulations and give directions regarding the anchorage station, management and control of all vessels within the harbor of Providence.

Sec. 2. Every vessel entering said harbor shall be anchored by the master or person in command thereof, according to the directions of the harbor master.

Sec. 3. All vessels not anchored according to the directions of the harbor master shall be forthwith moved by their crews under his direction; and if any such vessel have not sufficient crew to move the same, such vessel shall be moved by the harbor master. * * *

Sec. 4. No warp or line shall be passed across the channel so as to obstruct vessels passing along the same.

Sec. 5. Vessels shall not in any case be placed alongside of any wharf in said harbor more than three deep, without permission of the harbor master.

Sec. 6. The master, owners or persons in charge of any square-rigged vessel shall, as soon as may be after such vessel is made fast to any wharf or other vessel, cause the lower yards to be cockbilled, and the topsail yards to be braced fore and aft; and the jib-boom of any vessel shall be rigged in whenever so directed by the harbor master.

Sec. 7. The harbor master may remove * * * any vessel not employed in receiving or discharging cargo, * * * and shall be the sole judge of the fact of any vessel's being fairly and legitimately engaged in the receiving or discharging of cargo. He may also determine the extent, time and manner of accommodation respecting the stations of vessels, which should be extended by the owners or masters thereof to each other, and to require such accommodation to be extended.

Sec. 8. The master * * * of every vessel intending to unload lumber in the stream shall first obtain from the harbor master a permit designating the locality where such lumber may be rafted; but no vessel shall obstruct the channel in so doing.

Sec. 9. Every vessel drawing more than twenty feet of water, and approaching the harbor at any other than high tide, shall anchor below "The Crook" (so-called) until the tide shall warrant a free passage.

Sec. 10. No steamboat shall proceed at a greater speed than five miles an hour between Sassafras Point and Crawford Street bridge, in entering or leaving or moving within the harbor.

QUARANTINE.

Extracts from the rules adopted by the Board of Aldermen, and in force 1902.

Rule 28. The quarantine ground of the port of Providence shall be that portion of the harbor lying eastward of the main channel of Providence River, extending from Field's point to Sassafras point.

Rule 29. Every vessel bound for the harbor of Providence that shall have on board, or that shall have had on board during the passage, any person sick with fever of any description, with cholera, smallpox or other contagious or infectious disease, and every vessel that shall be subject to quarantine under any order or rule that may be established from time to time by the board of aldermen, shall anchor at the quarantine ground and be subject to examination and quarantine, although such vessel may have called at, or discharged its cargo at, any other port in the United States; and the person in command of such vessel shall place in the main shrouds thereof a flag as a signal, and such vessel shall remain at anchor at said ground with the flag in the shrouds, until written permission shall have been given for such vessel to leave by the health officer.

Rule 30. The health officer may demand such information, and ask such questions as he shall deem necessary or proper, of the captain or commanding officer, or other person on board of any vessel arriving at this port and subject to quarantine, respecting the condition of such vessel, and the health of the persons on board the same; * * *

Rule 31. If any vessel in the harbor of the city, whether subject to quarantine or not, shall have any sickness on board, or if such vessel or the cargo thereof is in a condition dangerous to the public health, in the opinion of the health officer, said health officer may subject such vessel to the regulations of quarantine, so far as in his opinion may be necessary to prevent all such danger.

Rule 32. No provisions, spirituous liquors or other articles shall be permitted to be brought on board any vessel at quarantine, without the written permission of the health officer.

Rule 33. No portion of the cargo, personal baggage, clothing or other goods shall be delivered from on board any vessel at quarantine, except in such manner and at such places as the health officer shall in writing direct.

Rule 34. No person in any boat or vessel shall go alongside of any vessel at quarantine, nor be at anchor or remain within one hundred yards of such vessel at quarantine, without written permission from the health officer.

Rule 35. Every vessel at quarantine shall be stationed at such place as the health officer shall direct.

Rule 40. The superintendent of health shall receive the sum of three dollars for each visit made by him to any vessel subject to quarantine, together with his necessary expenses in making such visit, to be paid by the owners, agents or commanders of the vessels visited by him.

APPENDIX III.

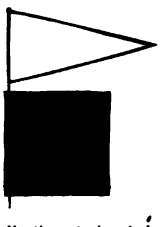
STORM WARNING DISPLAYS OF THE U. S. WEATHER BUREAU.

STORM DISPLAYS ALONG THE SEACOAST.

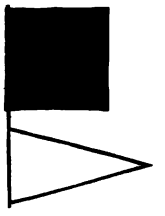
A red flag with a black center indicates that the storm is expected to be of marked violence.

The pennants displayed with the flags indicate the direction of the wind; red, easterly (from north through east to south); white, westerly (from south through west to north). The pennant above the flag indicates that the wind is expected to blow from the northerly quadrant; below, from the southerly quadrant.

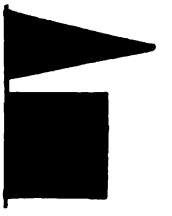
STORM WARNING FLAGS.



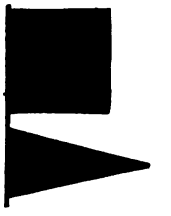
Northwesterly winds.



Southwesterly winds.



Northeasterly winds.



Southeasterly winds.

By night a red light will indicate easterly winds and a white light above a red light will indicate westerly winds.

Hurricane.

The "**Hurricane Display**" denotes the expected approach of a hurricane or of one of the severe and dangerous storms that occasionally move across the Gulf of Mexico and along the Atlantic Coast.

APPENDIX IV.

REGULATIONS U. S. PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

APPROVED NOVEMBER 21, 1902.

(*Extracts.*)

DUTIES OF COMMISSIONED OFFICERS.

PROFESSIONAL DUTIES.

116. The professional duties of commissioned officers are to examine all applicants for relief, to prescribe for and furnish out-patient or hospital treatment as may be required, and to make physical examinations of the seamen of the several Government services and the merchant marine, under such regulations as shall hereinafter appear.

Professional duties defined.

117. Commissioned officers will, upon the application of the United States shipping commissioner, or of the master or owner of any United States vessel engaged in the foreign, coastwise, or inland navigation trade, examine as to his physical condition any seaman brought to them for that purpose, and will give a certificate as to his fitness or unfitness for service. They will physically examine, in accordance with existing regulations governing physical examinations, any foreign seamen sent them for that purpose by the duly authorized agent of a foreign line or by the consul representing the nation to which the vessel belongs. A fee of $1 will be charged for each examination of a foreign seaman, and fees so received will be deposited with the collector of customs in the same manner as donations to the marine-hospital fund. Officers will also, upon the application of the proper authority, examine cadets, enlisted men, and persons desiring to enlist in the Revenue-Cutter, Life-Saving, Coast-Survey, and Light-House services, or to instruct them in the mode of resuscitating persons apparently drowned. No fee will be charged for this service. They will also examine alien immigrants when detailed for that purpose. They will also, when officially requested, furnish to commanding officers of revenue cutters certificates as to the physical condition of enlisted men of the Revenue-Cutter Service who may be under treatment in hospital or as out-patients. * * *

To examine seamen, cadets, enlisted men, etc., as to their physical condition.

119. Whenever officially requested by the local inspectors of steam vessels or other proper officers, commissioned officers will examine applicants for pilot's license as to sense of hearing, color perception, and general visual capacity, and will give a certificate accordingly.

To examine applicants for pilot's license.

120. No fee will be charged by any officer of the Public Health and Marine-Hospital Service for the medical examination or professional treatment of seamen of the United States merchant marine or for making a certificate as to their physical condition, and no officer shall accept a fee for professional service relating to the public service.

No fee to be charged.

SANITARY DUTIES.

123. It shall be the duty of commissioned officers to enforce the national health and quarantine laws and regulations; but no additional compensation shall be allowed said officers by reason of such service as they may be required to perform except actual and necessary traveling expenses.

To enforce national quarantine rules and regulations. Apr. 29, 1878, s. 3; Feb. 15, 1893.

127. Upon the outbreak of smallpox at or near a relief station, commissioned officers will vaccinate such seamen as may come to the marine-hospital officer for the purpose; and officers are authorized at all times to visit vessels to examine and vaccinate crews.

To vaccinate seamen.

RELIEF STATIONS.

Definition.

404. A relief station of the Public Health and Marine-Hospital Service is a port or place where an officer of the Service is on duty to extend relief to seamen, or where an officer of the customs service is specifically authorized to extend said relief.

Classes.

405. Relief stations shall be divided into the following classes:

Class I. United States marine hospitals.

Class II. All other stations under command of a commissioned officer.

Class III. All stations under charge of an acting assistant surgeon where there is a contract for the care of sick and disabled seamen.

Class IV. All other relief stations not included in the above classes.

Provisions for relief.

406. At all relief stations where the number of patients warrants, an officer of the Service will be assigned to the command of the station, and whenever practicable the patients of the Service will be treated in hospitals maintained exclusively for their benefit. * * *

Provision for marine-hospital dispensaries.

408. At each relief station of the first and second class, and whenever practicable at each relief station of the third class where an acting assistant surgeon of the Service is on duty, there shall be a marine-hospital office, where applicants for relief shall be received and examined, and the necessary action taken according to the regulations.

Location of offices and dispensaries.

409. The marine-hospital office shall be located at the custom-house whenever practicable and suitable office room for that purpose shall be set apart by the custodian of the custom-house building, subject to the approval of the Secretary of the Treasury.

BENEFICIARIES.

Persons entitled to relief.

411. The persons entitled to the benefits of the Public Health and Marine-Hospital Service are those employed on board in the care, preservation, or navigation of any registered, enrolled, or licensed vessel of the United States, or in the service on board of those engaged in such care, preservation, or navigation. Officers and crews of the Light-House Establishment, officers and crews of the Revenue-Cutter Service, seamen employed on the vessels of the Mississippi River Commission, seamen employed on the vessels of the Engineer Corps of the Army, and keepers and crews of the United States Life-Saving Service are entitled to the facilities of the hospitals and relief stations under special rules hereinafter prescribed.

Coast and Geodetic Survey entitled to relief.

412. Officers on vessels of the Coast and Geodetic Survey and seamen thereon, who are not enlisted men from the Navy, are entitled to the benefits of the Service.

Yachtsmen entitled.

413. Seamen employed on yachts are entitled to treatment, provided the said yachts are enrolled, licensed, or registered as vessels of the United States.

Seamen on United States Army transports, etc., entitled to treatment.

414. Seamen employed on United States Army transports or other vessels belonging to the Quartermaster's Department, United States Army, when not enlisted men of the Army, are entitled to the benefits of the Service.

Exceptions, R. S., s. 4804.

415. No person employed in or connected with the navigation, management, or use of canal boats engaged in the coasting trade shall, by reason thereof, be entitled to any benefit or relief from the Service.

Wrecked seamen entitled.

417. Seamen taken from wrecked vessels of the United States are entitled to the benefits of the Service if sick or disabled, and will be furnished care and treatment without reference to the length of time they have been employed.

Seamen sent by consular officers entitled. U. S. Rev. Stat., s. 4577.

418. Seamen employed on merchant vessels of the United States returned to the United States from foreign ports by United States consular officers, if sick or disabled at the time of their arrival in a port of the United States, shall be entitled to the benefits of the Service without reference to length of service.

Seamen must make application for relief.

419. A sick or disabled seaman, in order to obtain the benefits of the Service, must apply in person, or by proxy if too sick or disabled so to do, at the office of the Public Health and Marine-Hospital Service, to an officer of that Service, or to the proper customs officer acting as the agent of the said Service at stations where no medical officer is on duty, and must furnish satisfactory evidence that he is entitled to relief under the regulations.

Evidence to be presented by applicant.

420. Master's certificates and discharges from United States shipping commissioners, made out and signed in proper form, showing that the applicant for relief has been employed for sixty days of continuous service "in a registered, enrolled, or licensed vessel of the United States," a part of which

must have been during the sixty days immediately preceding his application for relief, shall entitle him to treatment. The phrase "sixty days continuous service" shall not be held to exclude seamen whose papers show brief intermission between short services that aggregate the required sixty days.

U. S. Rev. Stat., 4803.

421. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seaman on said vessel may be accepted as evidence in lieu of the master's certificate in cases where the latter is not procurable.

Certificates from owners or agents as evidence.

422. Masters of documented vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessel a certificate (Form 1915) of the length of time said seaman has been so employed, giving the dates of such employment. This certificate will be filed in the marine-hospital office or office of the customs officer when application is made for relief, whether the relief is furnished or the claim rejected.

Masters must furnish certificate of service.

423. Any master of a vessel or other person who shall furnish a false certificate of service, with intent to procure the admission of a seaman into any marine hospital, shall be immediately reported to the nearest United States attorney for prosecution.

False certificates.

424. When an interval has occurred in the applicant's seafaring service by reason of the closure of navigation on account of ice or low water, such interval shall not be considered as excluding him from relief unless the sickness or injury for which he applies for relief be the direct result of employment on shore.

Exceptions.

425. During the season when navigation is closed at any port, by reason of ice or low water, seamen applying for relief at such ports shall be entitled to same, provided they present the documentary evidence required in paragraph 420, which must show that the applicants were employed within sixty days immediately preceding the said closure of navigation, and provided it does not appear that the disease or injury is the result of employment on shore, or the result of vicious habits.

Closure of navigation.

426. The time during which a seaman has been under treatment in hospital as a patient of the Service shall not be reckoned as absence from vessel in respect to debarring him from further relief.

Period of treatment not to be reckoned as absence from vessel.

427. Whenever an applicant for relief presents himself at the marine-hospital office or the custom-house without a master's certificate or shipping commissioner's discharge and it is impracticable to obtain such certificate, the affidavit of the applicant as to the facts of his last employment, stating names of vessels and dates of service, may be accepted as evidence in support of his claim for the benefits of the Service.

Affidavits may be accepted as evidence.

428. When the period of the seaman's service as shown by his certificate on last vessel is less than sixty days, his affidavit as to previous service may be accepted.

Brief service on last vessel not a bar to relief.

431. When a seaman applies for relief after an absence of sixty days or more from his last vessel, and it satisfactorily appears that such absence was due to sickness or injury acquired in the line of duty, and that it was impracticable for him to apply to the proper officer for treatment, a statement of the facts, together with a copy of the application and other papers in support of same, shall be forwarded, with the recommendation of the medical officer, to the Surgeon-General for decision.

Applications for relief after sixty days' absence from vessel.

432. Any seaman who is able to write will be expected to sign his name upon the face of the master's certificate issued to him before said certificate is signed by the master of the vessel. * * *

Seamen to sign certificates.

434. When a seaman who has received continuous treatment at the out-patient office for a period of two months applies for further treatment he must, to entitle him to treatment, furnish a new certificate of service, showing that he is still following his vocation as seaman, or give satisfactory evidence that such service has been prevented by closure of navigation or by sickness, the latest dates of service and, in case of lack of recent service, its explanation, to appear in each new relief certificate.

Out-patients to furnish new service certificates.

435. The expenses of caring for sick and disabled seamen incurred during a voyage will not be paid by the Service.

Expenses for sickness during voyage.

436. The expenses for the care and treatment of seamen suffering from contagious diseases, who are entitled to the benefits of the Service, and who, in accordance with the State or municipal health laws and regulations are taken to quarantine or other hospitals under charge of the local health authorities, will not be paid unless such seamen were admitted at the time by the request of an officer of the Service.

Seamen admitted to local quarantine hospitals.

Money not to be paid to seamen for expenses of sickness.

437. In no case shall money be paid to a seaman or to his family or friends by the Service as reimbursement for expenses incurred during his sickness or disability.

Seamen injured in brawls not to receive treatment.

439. Seamen who may be injured in street brawls or while committing a breach of the peace, and are therefore confined in jail or taken to civil hospitals by the local authorities for such acts, shall not receive treatment at the expense of the Service.

Seamen taken ill on vessel entitled.

440. Seamen taken sick or injured while actually employed on a documented vessel shall be entitled to treatment at relief stations without reference to the length of their service.

Certificates of discharge.

441. A certificate of discharge may, at the discretion of the officer in charge of the case, be given to a hospital patient, but such certificate when presented at another relief station shall not be taken as sufficient evidence of the applicant's title to marine-hospital relief, but may be considered as collateral to other satisfactory data submitted by the seaman.

Only temporary relief contemplated.

442. Temporary relief only is contemplated, and admission to hospital is not intended to permit an indefinite residence therein for cause other than actual disease or injury.

THE REVENUE-CUTTER SERVICE.

Admitted without regard to length of service.

444. The officers and crews of the Revenue-Cutter Service will receive hospital or out-patient treatment, as hereinafter provided, on certificate signed by the commanding officer or executive officer of a revenue cutter, without regard to length of service. The certificate shall contain a description of the applicant for relief. Officers on leave or waiting orders may sign their own certificate.

THE ENGINEER CORPS, UNITED STATES ARMY.

Seamen employed on vessels of the Engineer Corps, U. S. A., entitled.

453. Seamen employed on vessels under the charge of the Engineer Corps of the United States Army shall be admitted to the benefits of the Marine-Hospital Service without charge at stations of the first, second, and third class upon the written request of the commanding officers of said vessels.

THE LIGHT-HOUSE SERVICE.

Officers and crews of the Light-House Establishment entitled.

460. Officers and crews of the several vessels belonging to the Light-House Establishment, including light-ships, may be admitted to the benefits of the Public Health and Marine-Hospital Service upon the application of their respective commanding officers. No charge will be made for care and treatment.

UNITED STATES ARMY AND NAVY.

Officers and seamen of various Government services may be admitted.

461. Officers and enlisted men of the United States Army and Navy may be admitted for care and treatment as patients of the service only upon the written request of their respective commanding officers. Every such admission shall be immediately reported to the Surgeon-General by the officer in charge of the station, on a daily report (Form 1957) or relief certificate (Form 1916), accompanied by a copy of the request upon which such officer or enlisted man was admitted. They shall be furnished treatment at stations of the first, second, and third class only. The rate of charge to be made for the care and treatment of the said officers and enlisted men will be fixed by the Department at the beginning of each fiscal year, and will be announced to officers and others in the annual circular entitled "Contracts for care of seamen." Patients of the above-named class are not subject to the provisions requiring transportation to marine hospitals.

FOREIGN SEAMEN.

Foreign seamen may be treated. Sec. 6, act Mar. 3, 1875; 18 Stat. L., 485.

462. The accommodations provided for the care and treatment of the patients of the Public Health and Marine-Hospital Service are also available to foreign seamen at relief stations of the first, second, and third class upon the application of the consular officer of the nation under whose flag they are sailing; or upon the application of the masters of the vessels upon which said seamen serve, provided satisfactory written security is given for the payment of the expenses of such care and treatment, at rates fixed annually by the Department.

463. A bill (Form 1928) in duplicate must be rendered by the officer of the Service * * *. One copy of this bill shall be delivered to the collector of customs, who shall at once collect the amount * * *. Bills for care and treatment. Form 1928.

464. Customs officers acting as agents of the Public Health and Marine-Hospital Service shall collect all bills for the care and treatment of seamen of the classes enumerated in paragraphs 461 and 462 * * *. Monthly accounts to be rendered.

465. Collectors of customs will notify the commanding officer of the vessel of the class enumerated in paragraphs 461 and 462, upon whose request the seaman was admitted, of the amount of the bill, and when paid will give a receipt therefor. * * * Notification of amount of bill.

466. The rate of charge to be made for the care and treatment of foreign seamen will be fixed by the Department at the beginning of each fiscal year, and will be announced to officers and others in the annual circular entitled "Contracts for care of seamen." Foreign seamen are not subject to the provision of paragraphs 493 and 501 requiring transportation to marine hospitals. Charges for care and treatment.

RELIEF.

OUT-PATIENT RELIEF.

467. Sick and disabled seamen entitled under these regulations to the benefits of the Service whose diseases or injuries are of such a nature that they can properly be relieved by medicines, dressings, or advice, without admission to hospital, shall be treated as out-patients, and furnished medicines, dressings, surgical appliances, or advice, as the case may require. Cases to be treated as out-patients.

468. Seamen will not be furnished relief at their own homes, except by special authority from the Surgeon General, and then only an allowance for medical attendance and medicines will be made at rates fixed by the Treasury Department. No relief furnished at homes of patients.

HOSPITAL RELIEF.

480. A sick or disabled seaman entitled to the benefits of the Service shall be admitted to hospital only in cases where the gravity of the disease or injury from which he suffers is such as to require hospital treatment in the opinion of an officer of the Service, or of a reputable physician designated by the Department to act at a place where no officer is stationed. Cases for hospital treatment.

STATIONS OF THE FIRST CLASS.

483. A bed ticket (Form 1919) shall be prepared and delivered to the applicant for relief in a sealed envelope addressed to the officer or other person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the ticket will be invalid. To be valid only for day of issue.

STATIONS OF THE SECOND CLASS.

491. A bed ticket (Form 1919) shall be prepared and delivered to the applicant for relief in a sealed envelope addressed to the officer or other person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the ticket will be invalid. To be valid only for day of issue.

STATIONS OF THE THIRD CLASS.

499. Customs officers, or acting assistant surgeons, when in charge of the station by special authority of the Bureau, shall issue hospital permits for the care and treatment of such applicants as may be found to be entitled to the benefits of the Service and require hospital treatment. The period for which treatment is authorized by the permit * * * should in no case exceed twenty days. Permits for hospital relief.

STATIONS OF THE FOURTH CLASS.

512. Customs officers, or acting assistant surgeons, when in charge of the station by special authority of the Bureau, shall issue hospital permits for the care and treatment of such applicants as may be found to be entitled to the benefits of the Service and require hospital treatment. The period for which treatment is authorized by the permit * * * should in no case exceed twenty days. Permits for hospital relief.

Permits valid only on day of issue.

515. The hospital permit, before being delivered to the applicant for relief, must be inclosed in an envelope, sealed, and addressed to the person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the permit will be invalid.

Foreign seamen et al. not treated.

479. Foreign seamen or employees of the various Government services, not beneficiaries, shall not be treated.

INSANE SEAMEN.

Relief for insane seamen. Mar. 3, 1875.

531. Insane seamen entitled to the benefits of the Service may be admitted to the Government Hospital for the Insane, Washington, D. C., upon the order of the Secretary of the Treasury.

DECEASED SEAMEN.

Relatives to be notified.

538. On the death of a patient while under the charge of the Service, notice to receive his effects shall be given by letter or otherwise to his nearest known relative. * * *

Burial expenses.

539. The necessary expenses of a plain burial for deceased patients of the Service will be paid, but no part of the expenses of the burial of any deceased seaman will be paid for at the expense of the Marine-Hospital Service unless said seaman was at the time of his death a patient of the Service. When friends or relatives of a deceased seaman claim the body and assume charge of the funeral arrangements, no part of the expenses of the same will be paid by the Marine-Hospital Service.

NATIONAL QUARANTINES.

QUARANTINE LAWS.

AN ACT granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service.

(*Extracts.*)

[Approved February 15, 1893, and amended August 18, 1894, and March 2, 1901.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any merchant ship or other vessel from any foreign port or place of [to] enter any port of the United States except in accordance with the provisions of this act and with such rules and regulations of State and municipal health authorities as may be made in pursuance of, or consistent with, this act; and any such vessel which shall enter, or attempt to enter, a port of the United States in violation thereof shall forfeit to the United States a sum, to be awarded in the discretion of the court, not exceeding five thousand dollars, which shall be a lien upon said vessel, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

SEC. 2. That any vessel at any foreign port clearing for any port or place in the United States shall be required to obtain from the consul, vice-consul, or other consular officer of the United States at the port of departure, or from the medical officer where such officer has been detailed by the President for that purpose, a bill of health, in duplicate, in the form prescribed by the Secretary of the Treasury, setting forth the sanitary history and condition of said vessel, and that it has in all respects complied with the rules and regulations in such cases prescribed for securing the best sanitary condition of the said vessel, its cargo, passengers, and crew; and said consular or medical officer is required, before granting such duplicate bill of health, to be satisfied that the matters and things therein stated are true; and for his services in that behalf he shall be entitled to demand and receive such fees as shall by lawful regulation be allowed, to be accounted for as is required in other cases.

The President, in his discretion, is authorized to detail any medical officer of the Government to serve in the office of the consul at any foreign port for the purpose of furnishing information and making the inspection and giving the bills of health hereinbefore

mentioned. Any vessel clearing and sailing from any such port without such bill of health, and entering any port of the United States, shall forfeit to the United States not more than five thousand dollars, the amount to be determined by the court, which shall be a lien on the same, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

The provisions of this section shall not apply to vessels plying between foreign ports on or near the frontiers of the United States and ports of the United States adjacent thereto; but the Secretary of the Treasury is hereby authorized, when, in his discretion, it is expedient for the preservation of the public health, to establish regulations governing such vessels.

SEC. 5. That the Secretary of the Treasury shall from time to time issue to the consular officers of the United States and to the medical officer serving at any foreign port, and otherwise make publicly known, the rules and regulations made by him, to be used and complied with by vessels in foreign ports, for securing the best sanitary condition of such vessels, their cargoes, passengers, and crew, before their departure for any port in the United States, and in the course of the voyage; and all such other rules and regulations as shall be observed in the inspection of the same on the arrival thereof at any quarantine station at the port of destination, and for the disinfection and isolation of the same, and the treatment of cargo and persons on board, so as to prevent the introduction of cholera, yellow fever, or other contagious or infectious diseases; and it shall not be lawful for any vessel to enter said port to discharge its cargo, or land its passengers, except upon a certificate of the health officer at such quarantine station certifying that said rules and regulations have in all respects been observed and complied with, as well on his part as on the part of the said vessel and its master, in respect to the same and to its cargo, passengers, and crew; and the master of every such vessel shall produce and deliver to the collector of customs at said port of entry, together with the other papers of the vessel, the said bills of health required to be obtained at the port of departure and the certificate herein required to be obtained from the health officer at the port of entry; and that the bills of health herein prescribed shall be considered as part of the ship's papers, and when duly certified to by the proper consular officer or other officer of the United States, over his official signature and seal, shall be accepted as evidence of the statements therein contained in any court of the United States.

SEC. 6. That on the arrival of an infected vessel at any port not provided with proper facilities for treatment of the same, the Secretary of the Treasury may remand said vessel, at its own expense, to the nearest national or other quarantine station, where accommodations and appliances are provided for the necessary disinfection and treatment of the vessel, passengers, and cargo; and after treatment of any infected vessel at a national quarantine station, and after certificate shall have been given by the United States quarantine officer at said station that the vessel, cargo, and passengers are each and all free from infectious disease, or danger of conveying the same, said vessel shall be admitted to entry to any port of the United States named within the certificate. But at any ports where sufficient quarantine provision has been made by State or local authorities the Secretary of the Treasury may direct vessels bound for said ports to undergo quarantine at said State or local station.

SEC. 7. That whenever it shall be shown to the satisfaction of the President that by reason of the existence of cholera or other infectious or contagious diseases in a foreign country there is serious danger of the introduction of the same into the United States, and that notwithstanding the quarantine defense this danger is so increased by the introduction of persons or property from such country that a suspension of the right to introduce the same is demanded in the interest of the public health, the President shall have power to prohibit, in whole or in part, the introduction of persons and property from such countries or places as he shall designate, and for such period of time as he may deem necessary.

SEC. 10. That the Supervising Surgeon General, with the approval of the Secretary of the Treasury, is authorized to designate and mark the boundaries of the quarantine grounds and quarantine anchorages for vessels which are reserved for use at each United States quarantine station; and any vessel or officer of any vessel or other person, other than State or municipal health or quarantine officers, trespassing or otherwise entering upon such grounds or anchorages in disregard of the quarantine rules and regulations, or without permission of the officer in charge of such station, shall be deemed guilty of a misdemeanor and subject to arrest, and upon conviction thereof be punished by a fine of not more than three hundred dollars or imprisonment for not more than one year, or both, in the discretion of the court. Any master or owner of any vessel, or any person violating any provision of this Act or any rule or regulation made in accordance with this Act, relating to inspection of vessels or relating to the prevention of the introduction of contagious or infectious diseases, or any master, owner, or agent of any vessel making a false statement relative to the sanitary condition of said vessel or its contents or as to the health of any passenger or person thereon, shall be deemed guilty of a misdemeanor and subject to arrest, and upon conviction thereof be punished by a fine of not more than five hundred dollars or imprisonment for not more than one year, or both, in the discretion of the court.

SEC. 11. That any vessel sailing from any foreign port without the bill of health required by section two of this Act, and arriving within the limits of any collection district of the United States, and not entering or attempting to enter any port of the United States, shall be subject to such quarantine measures as shall be prescribed by regulations of the Secretary of the Treasury, and the cost of such measures shall be a lien on said vessel, to be recovered by proceedings in the proper district court of the United States and in the manner set forth above as regards vessels from foreign ports without bills of health and entering any port of the United States.

QUARANTINE REGULATIONS.

(*Extracts.*)

INSPECTION OF VESSELS LEAVING FOREIGN PORTS AND PORTS IN THE POSSESSIONS OR OTHER DEPENDENCIES OF THE UNITED STATES FOR PORTS IN THE UNITED STATES OR ITS POSSESSIONS OR OTHER DEPENDENCIES.

5. The officer issuing the bill of health shall satisfy himself, by inspection if necessary, that the conditions certified to therein are true, and is authorized, in accordance with the law, to withhold the bill of health or the supplemental bill of health until he is satisfied that the vessel, the passengers, the crew, and the cargo have complied with all the quarantine laws and regulations of the United States.

6. Inspection is required of—

(*a*) All vessels from ports at which cholera, yellow fever, or plague prevails, or at which smallpox or typhus fever prevails in epidemic form.

(*b*) All vessels carrying steerage passengers; but need only include the inspection of such passengers and their living apartments, if sailing from a healthy port.

7. Inspection of the vessel is such an examination of the vessel, cargo, passengers, crew, personal effects of same, including examination of manifests and other papers, food and water supply, the ascertainment of its relations with the shore, the manner of loading and possibilities of invasion by small animals as will enable the inspecting officer to determine if these regulations have been complied with.

8. When an inspection is required, it should be made by daylight, as late as practicable before sailing. The vessel should be inspected before the passengers go aboard, the passengers just before embarkation, and the crew on deck; and no communication should be had with the vessel after such inspection except by permission of the officer issuing the bill of health.

INSPECTION.

59. Every vessel subject to quarantine inspection, entering a port of the United States, its possessions or dependencies, shall be considered in quarantine until given free pratique. Such vessel shall fly a yellow flag at the foremast head from sunrise to sunset, and shall observe all the other requirements of vessels actually quarantined.

60. Vessels arriving at ports of the United States under the following conditions shall be inspected by a quarantine officer prior to entry:

(*a*) All vessels from foreign ports except those enumerated in paragraph 4.

(*b*) Any vessel with sickness on board.

(*c*) Vessels from domestic ports where cholera, plague, or yellow fever prevails, or where smallpox or typhus fever prevails in epidemic form.

(*d*) Vessels from ports suspected of infection with yellow fever, having entered a port north of the southern boundary of Maryland without disinfection, shall be subjected to a second inspection before entering any ports south of said latitude during the quarantine season of such port.

61. The inspections of vessels required by these regulations shall be made between sunrise and sunset, except in case of vessels in distress.

64. No person, except the quarantine officer, his employees, United States customs officers, pilots, or other persons authorized by the quarantine officer, shall be permitted to board any vessel subject to quarantine inspection until after the vessel has been inspected by the quarantine officer and granted free pratique, and all such persons so boarding such vessel shall, in the discretion of the quarantine officer, be subject to the same restrictions as the personnel of the vessel.

65. Towboats or any other vessels having had communication with vessels subject to inspection shall themselves be subject to inspection.

QUARANTINE.

68. Vessels arriving under the following conditions shall be placed in quarantine:

(*a*) With quarantinable disease on board or having had such disease on board during the voyage.

(*b*) Any vessel which the quarantine officer considers infected.

(*c*) If arriving at a port south of the southern boundary of Maryland in the season of close quarantine, May 1 to November 1, directly or via a northern port, from a tropical American port, unless said port is known to be free from yellow fever.

(*d*) In case of vessels arriving at a northern port without sickness on board from ports where yellow fever prevails, the personnel shall be detained under observation at quarantine to complete five days from the port of departure.

(*e*) Towboats and other vessels having had communication with vessels subject to quarantine shall themselves be quarantined if they have been exposed to infection.

69. Vessels arriving under the following conditions need not be subject to quarantine:

A. Vessels from yellow fever ports bound for ports in the United States north of the southern boundary of Maryland, with good sanitary condition and history, having had no sickness on board at ports of departure, en route or on arrival, provided they have been five days from last infected or suspected port.

B. Vessels engaged in the fruit trade may be admitted to entry without detention, provided that they have complied in all respects with the special rules and regulations made by the Secretary of the Treasury with regard to vessels engaged in said trade.

GENERAL REQUIREMENTS AT QUARANTINE.

71. No direct communication shall be allowed between any vessel in quarantine and any person or place outside, and no communication whatever between quarantine or any vessel in quarantine and any person or place outside except under the supervision of the quarantine officer.

SPECIAL REGULATIONS RELATING TO NAVAL VESSELS.

151. Vessels of the U. S. Navy may be granted the hereinafter stated exemptions from quarantine regulations, but are subject to quarantine inspection upon arrival at a port of the United States.

152. The certificates of the medical officers of the U. S. Navy as to the sanitary history and condition of the vessel and its personnel may be accepted for naval vessels by the quarantine officer boarding the vessel in lieu of an actual inspection.

153. Vessels of the U. S. Navy having entered the harbors of infected ports, but having held no communication which is liable to convey infection, may be exempted from the disinfection and detention imposed on merchant vessels from such ports.

APPENDIX V.

RULES TO PREVENT COLLISIONS OF VESSELS.

Compiled for insertion in volumes of the U. S. Coast Pilot, Atlantic Coast.

AN ACT in regard to collisions at sea.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in every case of collision between two vessels it shall be the duty of the master or person in charge of each vessel, if and so far as he can do so without serious danger to his own vessel, crew, and passengers (if any), to stay by the other vessel until he has ascertained that she has no need of further assistance, and to render to the other vessel, her master, crews and passengers (if any), such assistance as may be practicable and as may be necessary in order to save them from any danger caused by the collision, and also to give to the master or person in charge of the other vessel the name of his own vessel and her port of registry, or the port or place to which she belongs, and also the names of the ports and places from which and to which she is bound. If he fails so to do, and no reasonable cause for such failure is shown, the collision shall, in the absence of proof to the contrary, be deemed to have been caused by his wrongful act, neglect, or default.

SEC. 2. That every master or person in charge of a United States vessel who fails, without reasonable cause, to render such assistance or give such information as aforesaid shall be deemed guilty of a misdemeanor, and shall be liable to a penalty of one thousand dollars, or imprisonment for a term not exceeding two years; and for the above sum the vessel shall be liable and may be seized and proceeded against by process in any district court of the United States by any person; one-half such sum to be payable to the informer and the other half to the United States.

SEC. 3. That this act shall take effect at a time to be fixed by the President by Proclamation issued for that purpose.

Approved September 4, 1890. Proclamation dated November 18, 1890, to take effect December 15, 1890.

INTERNATIONAL RULES.

I.—ENACTING CLAUSE, AND SCOPE.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following regulations for preventing collisions at sea shall be followed by all public and private vessels of the United States upon the high seas and in all waters connected therewith, navigable by sea-going vessels.

ART. 30. Nothing in these rules shall interfere with the operation of a special rule, duly made by local authority, relative to the navigation of any harbor, river, or inland waters.

PRELIMINARY DEFINITIONS.

In the following rules every steam-vessel which is under sail and not under steam is to be considered a sailing-vessel, and every vessel under steam, whether under sail or not, is to be considered a steam-vessel.

The word "steam-vessel" shall include any vessel propelled by machinery.

A vessel is "under way" within the meaning of these rules when she is not at anchor, or made fast to the shore, or aground.

II.—LIGHTS AND SO FORTH.

The word "visible" in these rules when applied to lights shall mean visible on a dark night with a clear atmosphere.

ART. 1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

STEAM VESSELS—MASTHEAD LIGHT.

ART. 2 A steam-vessel when under way shall carry—(*a*) On or in front of the foremast, or if a vessel without a foremast, then in the fore part of the vessel, at a height above the hull of not less than twenty feet, and if the breadth of the vessel exceeds twenty feet, then at a height above the hull not less than such breadth, so, however, that the light need not be carried at a greater height above the hull than forty feet, a bright white light, so constructed as to show an unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side, and of such a character as to be visible at a distance of at least five miles.

STEAM VESSELS—SIDE LIGHTS.

(*b*) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least two miles.

(*c*) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible at a distance of at least two miles.

(*d*) The said green and red side-lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

STEAM VESSELS—RANGE LIGHTS.

(*e*) A steam-vessel when under way may carry an additional white light similar in construction to the light mentioned in subdivision (*a*). These two lights shall be so placed in line with the keel that one shall be at least fifteen feet higher than the other, and in such a position with reference to each other that the lower light shall be forward of the upper one. The vertical distance between these lights shall be less than the horizontal distance.

STEAM VESSELS WHEN TOWING.

ART. 3. A steam-vessel when towing another vessel shall, in addition to her side-lights, carry two bright white lights in a vertical line one over the other, not less than six feet apart, and when towing more than one vessel shall carry an additional bright white light six feet above or below such light, if the length of the tow measuring from the stern of the towing vessel to the stern of the last vessel towed exceeds six hundred feet. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in article two (*a*), excepting the additional light, which may be carried at a height of not less than fourteen feet above the hull.

Such steam-vessel may carry a small white light abaft the funnel or aftermast for the vessel towed to steer by, but such light shall not be visible forward of the beam.

SPECIAL LIGHTS.

ART. 4. (*a*) A vessel which from any accident is not under command shall carry at the same height as a white light mentioned in article two (*a*), where they can best be seen, and if a steam-vessel in lieu of that light, two red lights, in a vertical line one over the other, not less than six feet apart, and of such a character as to be visible all around the horizon at a distance of at least two miles; and shall by day carry in a vertical line one over the other, not less than six feet apart, where they can best be seen, two black balls or shapes, each two feet in diameter.

(*b*) A vessel employed in laying or in picking up a telegraph cable shall carry in the same position as the white light mentioned in article two (*a*), and if a steam-vessel in lieu of that light, three lights in a vertical line one over the other not less than six feet apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all around the horizon at a distance of at least two miles. By day she shall carry in a vertical line, one over the other, not less than six feet apart, where they can best be seen, three shapes not less than two feet in diameter, of which the highest and lowest shall be globular in shape and red in color, and the middle one diamond in shape and white.

(*c*) The vessels referred to in this article, when not making way through the water, shall not carry the side-lights, but when making way shall carry them.

(*d*) The lights and shapes required to be shown by this article are to be taken by other vessels as signals that the vessel showing them is not under command and can not therefore get out of the way.

These signals are not signals of vessels in distress and requiring assistance. Such signals are contained in article thirty-one.

LIGHTS FOR SAILING VESSELS AND VESSELS IN TOW.

ART. 5. A sailing-vessel under way and any vessel being towed shall carry the same lights as are prescribed by article two for a steam-vessel under way, with the exception of the white lights mentioned therein, which they shall never carry.

LIGHTS FOR SMALL VESSELS.

ART. 6. Whenever, as in the case of small vessels under way during bad weather, the green and red side-lights can not be fixed, these lights shall be kept at hand, lighted and ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable, more than two points abaft the beam on their respective sides. To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

LIGHTS FOR SMALL STEAM AND SAIL VESSELS AND OPEN BOATS.

ART. 7. Steam-vessels of less than forty, and vessels under oars or sails of less than twenty tons gross tonnage, respectively, and rowing boats, when under way, shall not be required to carry the lights mentioned in article two (*a*), (*b*), and (*c*), but if they do not carry them they shall be provided with the following lights:

First. Steam-vessels of less than forty tons shall carry—

(*a*) In the fore part of the vessel, or on or in front of the funnel, where it can best be seen, and at a height above the gunwale of not less than nine feet, a bright white light constructed and fixed as prescribed in article two (*a*), and of such a character as to be visible at a distance of at least two miles.

(*b*) Green and red side-lights constructed and fixed as prescribed in article two (*b*) and (*c*), and of such a character as to be visible at a distance of at least one mile, or a combined lantern showing a green light and a red light from right ahead to two points abaft the beam on their respective sides. Such lanterns shall be carried not less than three feet below the white light.

Second. Small steamboats, such as are carried by seagoing vessels, may carry the white light at a less height than nine feet above the gunwale, but it shall be carried above the combined lantern mentioned in subdivision one (*b*).

Third. Vessels under oars or sails of less than twenty tons shall have ready at hand a lantern with a green glass on one side and a red glass on the other, which, on the approach of or to other vessels, shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

Fourth. Rowing boats, whether under oars or sail, shall have ready at hand a lantern showing a white light which shall be temporarily exhibited in sufficient time to prevent collision.

The vessels referred to in this article shall not be obliged to carry the lights prescribed by article four (*a*) and article eleven, last paragraph.

LIGHTS FOR PILOT VESSELS.

ART. 8. Pilot-vessels when engaged on their station on pilotage duty shall not show the lights required for other vessels, but shall carry a white light at the masthead, visible all around the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed fifteen minutes.

On the near approach of or to other vessels they shall have their side-lights lighted, ready for use, and shall flash or show them at short intervals, to indicate the direction in which they are heading, but the green light shall not be shown on the port side, nor the red light on the starboard side.

A pilot-vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board may show the white light instead of carrying it at the masthead, and may, instead of the colored lights above mentioned, have at hand, ready for use, a lantern with a green glass on the one side and a red glass on the other, to be used as prescribed above.

Pilot-vessels when not engaged on their station on pilotage duty shall carry lights similar to those of other vessels of their tonnage.

A steam pilot-vessel, when engaged on her station on pilotage duty and in waters of the United States, and not at anchor, shall, in addition to the lights required for all pilot-boats,

carry at a distance of eight feet below her white masthead light a red light, visible all around the horizon and of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles, and also the colored lights required to be carried by vessels when under way.

When engaged on her station on pilotage duty and in waters of the United States, and at anchor, she shall carry in addition to the lights required for all pilot boats the red light above mentioned, but not the colored side lights.

When not engaged on her station on pilotage duty, she shall carry the same lights as other steam vessels.

LIGHTS, ETC., OF FISHING VESSELS.

ART. 9. [*Article 9, act of August 19, 1890, was repealed by act of May 28, 1894, and article 10, act of March 3, 1885, was reenacted in part by act of August 13, 1894, and is reproduced here in part as article 9. It will be the object of further consideration by the maritime powers:*]

Fishing-vessels of less than twenty tons net registered tonnage, when under way and when not having their nets, trawls, dredges, or lines in the water, shall not be obliged to carry the colored side-lights; but every such vessel shall in lieu thereof have ready at hand a lantern with a green glass on the one side and a red glass on the other side, and on approaching to or being approached by another vessel such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

The following portion of this article applies only to fishing-vessels and boats when in the sea off the coast of Europe lying north of Cape Finisterre:

(*a*) All fishing-vessels and fishing-boats of twenty tons net registered tonnage or upward, when under way and when not having their nets, trawls, dredges, or lines in the water, shall carry and show the same lights as other vessels under way.

(*b*) All vessels when engaged in fishing with drift nets shall exhibit two white lights from any part of the vessel where they can be best seen. Such lights shall be placed so that the vertical distance between them shall be not less than six feet and not more than ten feet, and so that the horizontal distance between them, measured in a line with the keel of the vessel, shall be not less than five feet and not more than ten feet. The lower of these two lights shall be the more forward, and both of them shall be of such a character and contained in lanterns of such construction as to show all around the horizon, on a dark night, with a clear atmosphere, for a distance of not less than three miles.

(*c*) All vessels when trawling, dredging, or fishing with any kind of drag-nets shall exhibit, from some part of the vessel where they can be best seen, two lights. One of these lights shall be red and the other shall be white. The red light shall be above the white light, and shall be at a vertical distance from it of not less than six feet and not more than twelve feet; and the horizontal distance between them, if any, shall not be more than ten feet. These two lights shall be of such a character and contained in lanterns of such construction as to be visible all around the horizon, on a dark night, with a clear atmosphere, the white light to a distance of not less than three miles and the red light of not less than two miles.

(*d*) A vessel employed in line-fishing, with her lines out, shall carry the same lights as a vessel when engaged in fishing with drift nets.

(*e*) If a vessel, when fishing with a trawl, dredge, or any kind of drag-net, becomes stationary in consequence of her gear getting fast to a rock or other obstruction, she shall show the light and make the fog signal for a vessel at anchor.

(*f*) Fishing-vessels may at any time use a flare-up in addition to the lights which they are by this article required to carry and show. All flare-up lights exhibited by a vessel when trawling, dredging, or fishing with any kind of drag-net shall be shown at the after-part of the vessel, excepting that if the vessel is hanging by the stern to her trawl, dredge, or drag-net they shall be exhibited from the bow.

(*g*) Every fishing-vessel when at anchor between sunset and sunrise shall exhibit a white light, visible all around the horizon at a distance of at least one mile.

(*h*) In a fog a drift-net vessel attached to her nets, and a vessel when trawling, dredging, or fishing with any kind of drag-net, and a vessel employed in line-fishing with her lines out, shall, at intervals of not more than two minutes, make a blast with her fog horn and ring her bell alternately.

LIGHTS FOR AN OVERTAKEN VESSEL.

ART. 10. A vessel which is being overtaken by another shall show from her stern to such last-mentioned vessel a white light or a flare-up light.

The white light required to be shown by this article may be fixed and carried in a lantern, but in such case the lantern shall be so constructed, fitted, and screened that it shall throw an unbroken light over an arc of the horizon of twelve points of the compass, namely,

for six points from right aft on each side of the vessel, so as to be visible at a distance of at least one mile. Such light shall be carried as nearly as practicable on the same level as the side lights.

ANCHOR LIGHTS.

ART. 11. A vessel under one hundred and fifty feet in length, when at anchor, shall carry forward, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light in a lantern so constructed as to show a clear, uniform, and unbroken light visible all around the horizon at a distance of at least one mile.

A vessel of one hundred and fifty feet or upward in length, when at anchor, shall carry in the forward part of the vessel, at a height of not less than twenty and not exceeding forty feet above the hull, one such light, and at or near the stern of the vessel, and at such a height that it shall be not less than fifteen feet lower than the forward light, another such light.

The length of a vessel shall be deemed to be the length appearing in her certificate of registry.

A vessel aground in or near a fair-way shall carry the above light or lights and the two red lights prescribed by article four (*a*).

SPECIAL SIGNALS.

ART. 12. Every vessel may, if necessary in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that can not be mistaken for a distress signal.

NAVAL LIGHTS AND RECOGNITION SIGNALS.

ART. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal-lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorized by their respective Governments and duly registered and published.

STEAM VESSEL UNDER SAIL BY DAY.

ART. 14. A steam-vessel proceeding under sail only but having her funnel up, shall carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

III.—SOUND SIGNALS IN FOG, ETC.

PRELIMINARY.

ART. 15. All signals prescribed by this article for vessels under way shall be given:

First. By "steam-vessels" on the whistle or siren.

Second. By "sailing-vessels" and "vessels towed" on the fog horn.

The words "prolonged blast" used in this article shall mean a blast of from four to six seconds' duration.

A steam-vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn, to be sounded by mechanical means, and also with an efficient bell. (In all cases where the rules require a bell to be used, a drum may be substituted on board Turkish vessels, or a gong where such articles are used on board small seagoing vessels.) A sailing vessel of twenty tons gross tonnage or upward shall be provided with a similar fog horn and bell.

In fog, mist, falling snow, or heavy rain-storms, whether by day or night, the signals described in this article shall be used as follows, namely:

STEAM VESSEL UNDER WAY.

(*a*) A steam-vessel having way upon her shall sound, at intervals of not more than two minutes, a prolonged blast.

(*b*) A steam-vessel under way, but stopped, and having no way upon her, shall sound, at intervals of not more than two minutes, two prolonged blasts, with an interval of about one second between.

SAIL VESSEL UNDER WAY.

(*c*) A sailing vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack, one blast; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

VESSELS AT ANCHOR OR NOT UNDER WAY.

(*d*) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

VESSELS TOWING, ETC.

(*e*) A vessel when towing, a vessel employed in laying or picking up a telegraph cable, and a vessel under way, which is unable to get out of the way of an approaching vessel through being not under command, or unable to maneuver as required by the rules, shall, instead of the signals prescribed in subdivisions (*a*) and (*c*) of this article, at intervals of not more than two minutes, sound three blasts in succession, namely: One prolonged blast followed by short blasts. A vessel towed may give this signal and she shall not give any other.

SMALL SAILING VESSELS AND BOATS.

Sailing vessels and boats of less than twenty tons gross tonnage shall not be obliged to give the above-mentioned signals, but, if they do not, they shall make some other efficient sound signal at intervals of not more than one minute.

SPEED IN FOG.

ART. 16. Every vessel shall, in a fog, mist, falling snow, or heavy rain storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam-vessel hearing, apparently forward of her beam, the fog-signal of a vessel, the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

IV.—STEERING AND SAILING RULES.

PRELIMINARY.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SAILING VESSELS.

ART. 17. When two sailing-vessels are approaching one another, so as to invoke risk of collision, one of them shall keep out of the way of the other, as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(*b*) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the vessel which is to the windward shall keep out of the way of the vessel which is to the leeward.

(*e*) A vessel which has the wind aft shall keep out of the way of the other vessel.

STEAM VESSELS.

ART. 18. When two steam-vessels are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two vessels which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are when each of the two vessels is end on, or nearly end on, to the other; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own; and by night, to cases in which each vessel is in such a position as to see both the side-lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course; or by night, to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

TWO STEAM VESSELS CROSSING.

ART. 19. When two steam-vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

STEAM VESSEL SHALL KEEP OUT OF THE WAY OF SAILING VESSEL.

ART. 20. When a steam-vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, the steam vessel shall keep out of the way of the sailing vessel.

COURSE AND SPEED.

ART. 21. Where, by any of these rules, one of two vessels is to keep out of the way, the other shall keep her course and speed.

NOTE.—When in consequence of thick weather or other causes, such vessel finds herself so close that collision can not be avoided by the action of the giving-way vessel alone, she also shall take such action as will best aid to avert collision. (See articles twenty-seven and twenty-nine.)

CROSSING AHEAD.

ART. 22. Every vessel which is directed by these rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

STEAM VESSEL SHALL SLACKEN SPEED OR STOP.

ART. 23. Every steam-vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

OVERTAKING VESSELS.

ART. 24. Notwithstanding anything contained in these rules every vessel, overtaking any other, shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position, with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side-lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel can not always know with certainty whether she is forward of or abaft this direction from the other vessel, she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

NARROW CHANNELS.

ART. 25. In narrow channels every steam-vessel shall, when it is safe and practicable, keep to that side of the fair-way or mid-channel which lies on the starboard side of such vessel.

RIGHTS OF WAY OF FISHING VESSELS.

ART. 26. Sailing vessels under way shall keep out of the way of sailing vessels or boats fishing with nets, or lines, or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fair-way used by vessels other than fishing vessels or boats.

GENERAL PRUDENTIAL RULE.

ART. 27. In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

SOUND SIGNALS FOR PASSING STEAMERS.

ART. 28. The words "short blasts," used in this article, shall mean a blast of about one second's duration.

When vessels are in sight of one another, a steam-vessel under way, in taking any course authorized or required by these rules, shall indicate that course by the following signals on her whistle or siren, namely:

One short blast to mean, "I am directing my course to starboard."

Two short blasts to mean, "I am directing my course to port."

Three short blasts to mean, "My engines are going at full speed astern."

PRECAUTION.

ART. 29. Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

ART. 30. [See p. 229.]

DISTRESS SIGNALS.

ART. 31. When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

In the daytime—

First. A gun or other explosive signal fired at intervals of about a minute.

Second. The international code signal of distress indicated by N. C.

Third. The distance signal, consisting of a square flag, having either above or below it a ball or anything resembling a ball.

Fourth. A continuous sounding with any fog-signal apparatus.

At night—

First. A gun or other explosive signal fired at intervals of about a minute.

Second. Flames on the vessel (as from a burning tar barrel, oil barrel, and so forth).

Third. Rockets or shells throwing stars of any color or description, fired one at a time, at short intervals.

Fourth. A continuous sounding with any fog-signal apparatus.

INLAND RULES.

NOTE.—*The paragraphs indicated by a vertical line are identically the same as corresponding paragraphs in the International Rules.*

I.—ENACTING CLAUSE AND SCOPE.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following regulations for preventing collision shall be followed by all vessels navigating all harbors, rivers, and inland waters of the United States, except the Great Lakes and their connecting and tributary waters as far east as Montreal, and the Red River of the North and rivers emptying into the Gulf of Mexico and their tributaries, and are hereby declared special rules duly made by local authority:

ART. 30. The exhibition of any light on board of a vessel of war of the United States or a revenue cutter may be suspended whenever, in the opinion of the Secretary of the Navy, the commander in chief of a squadron, or the commander of a vessel acting singly, the special character of the service may require it.

PRELIMINARY DEFINITIONS.

In the following rules every steam-vessel which is under sail and not under steam is to be considered a sailing-vessel, and every vessel under steam, whether under sail or not, is to be considered a steam-vessel.

The word "steam-vessel" shall include any vessel propelled by machinery.

A vessel is "under way," within the meaning of these rules, when she is not at anchor, or made fast to the shore, or aground.

II.—LIGHTS AND SO FORTH.

The word "visible" in these rules, when applied to lights, shall mean visible on a dark night with a clear atmosphere.

ART. 1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

STEAM VESSELS—MASTHEAD LIGHT.

ART. 2. A steam-vessel when under way shall carry (*a*) on or in front of the foremast, or, if a vessel without a foremast, then in the forepart of the vessel, a bright white light so constructed as to show an unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side, and of such a character as to be visible at a distance of at least five miles.

STEAM VESSELS—SIDE LIGHTS.

(*b*) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least two miles.

(*c*) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible at a distance of at least two miles.

(*d*) The said green and red side-lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

STEAM VESSELS—RANGE LIGHTS.

(*e*) A sea-going steam-vessel when under way may carry an additional white light similar in construction to the light mentioned in subdivision (*a*). These two lights shall be so placed in line with the keel that one shall be at least fifteen feet higher than the other, and in such a position with reference to each other that the lower light shall be forward of the upper one. The vertical distance between these lights shall be less than the horizontal distance.

(*f*) All steam-vessels (except sea-going vessels and ferry-boats) shall carry in addition to green and red lights required by article two (*b*), (*c*), and screens as required by article two (*d*), a central range of two white lights; the after-light being carried at an elevation at least fifteen feet above the light at the head of the vessel. The head-light shall be so constructed as to show an unbroken light through twenty points of the compass, namely, from right ahead to two points abaft the beam on either side of the vessel, and the after-light so as to show all around the horizon.

STEAM VESSELS WHEN TOWING.

ART. 3. A steam-vessel when towing another vessel shall, in addition to her side-lights, carry two bright white lights in a vertical line one over the other, not less than three feet apart, and when towing more than one vessel shall carry an additional bright white light three feet above or below such lights, if the length of the tow, measuring from the stern of the towing vessel to the stern of the last vessel towed, exceed six hundred feet. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in article two (*a*) or the after range light mentioned in article two (*f*).

Such steam-vessels may carry a small white light abaft the funnel or aftermast for the vessel towed to steer by, but such light shall not be visible forward of the beam.

LIGHTS FOR SAILING VESSELS AND VESSELS IN TOW.

ART. 5. A sailing-vessel under way or being towed shall carry the same lights as are prescribed by article two for a steam-vessel under way, with the exception of the white lights mentioned therein, which they shall never carry.

LIGHTS FOR SMALL VESSELS.

ART. 6. Whenever, as in the case of vessels of less than ten gross tons under way during bad weather, the green and red side-lights can not be fixed, these lights shall be kept at

hand, lighted and ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable, more than two points abaft the beam on their respective sides. To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

LIGHTS FOR ROWING BOATS.

ART. 7. Rowing boats, whether under oars or sail, shall have ready at hand a lantern showing a white light which shall be temporarily exhibited in sufficient time to prevent collision.

LIGHTS FOR PILOT VESSELS.

ART. 8. Pilot-vessels, when engaged on their station on pilotage duty, shall not show the lights required for other vessels, but shall carry a white light at the masthead, visible all around the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals which shall never exceed fifteen minutes.

On the near approach of or to other vessels they shall have their side-lights lighted, ready for use, and shall flash or show them at short intervals to indicate the direction in which they are heading, but the green light shall not be shown on the port side nor the red light on the starboard side.

A pilot-vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board may show the white light instead of carrying it at the masthead, and may, instead of the colored lights above mentioned, have at hand ready for use, a lantern with a green glass on the one side and a red glass on the other, to be used as prescribed above.

Pilot vessels, when not engaged on their station on pilotage duty, shall carry lights similar to those of other vessels of their tonnage.

A steam pilot vessel, when engaged on her station on pilotage duty and in waters of the United States, and not at anchor, shall, in addition to the lights required for all pilot boats, carry at a distance of eight feet below her white masthead light a red light, visible all around the horizon and of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles, and also the colored lights required to be carried by vessels when under way.

When engaged on her station on pilotage duty and in waters of the United States, and at anchor, she shall carry, in addition to the lights required for all pilot boats, the red light above mentioned, but not the colored side lights.

When not engaged on her station on pilotage duty, she shall carry the same lights as other steam-vessels.

LIGHTS, ETC., OF FISHING VESSELS.

ART. 9. (*a*) Fishing-vessels of less than ten gross tons, when under way and when not having their nets, trawls, dredges, or lines in the water, shall not be obliged to carry the colored side-lights; but every such vessel shall, in lieu thereof, have ready at hand a lantern with a green glass on one side and a red glass on the other side, and on approaching to or being approached by another vessel such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

(*b*) All fishing-vessels and fishing-boats of ten gross tons or upward, when under way and when not having their nets, trawls, dredges, or lines in the water, shall carry and show the same lights as other vessels under way.

(*c*) All vessels, when trawling, dredging, or fishing with any kind of drag-nets or lines, shall exhibit, from some part of the vessel where they can be best seen, two lights. One of these lights shall be red and the other shall be white. The red light shall be above the white light, and shall be at a vertical distance from it of not less than six feet and not more than twelve feet; and the horizontal distance between them, if any, shall not be more than ten feet. These two lights shall be of such a character and contained in lanterns of such construction as to be visible all around the horizon, the white light a distance of not less than three miles and the red light of not less than two miles.

LIGHTS FOR RAFTS OR OTHER WATER CRAFT.

(*d*) Rafts, or other water craft not herein provided for, navigating by hand power, horse power, or by the current of the river, shall carry one or more good white lights,

which shall be placed in such manner as shall be prescribed by the Board of Supervising Inspectors of Steam Vessels.*

LIGHTS FOR AN OVERTAKEN VESSEL.

ART. 10. A vessel which is being overtaken by another, except a steam-vessel with an after range-light showing all around the horizon, shall show from her stern to such last-mentioned vessel a white light or a flare-up light.

ANCHOR LIGHTS.

ART. 11. A vessel under one hundred and fifty feet in length when at anchor shall carry forward, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light, in a lantern so constructed as to show a clear, uniform, and unbroken light visible all around the horizon at a distance of at least one mile.

A vessel of one hundred and fifty feet or upward in length when at anchor shall carry in the forward part of the vessel, at a height of not less than twenty and not exceeding forty feet above the hull, one such light; and at or near the stern of the vessel, and at such a height that it shall be not less than fifteen feet lower than the forward light, another such light.

The length of a vessel shall be deemed to be the length appearing in her certificate of registry.

SPECIAL SIGNALS.

ART. 12. Every vessel may, if necessary, in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that can not be mistaken for a distress signal.

NAVAL LIGHTS AND RECOGNITION SIGNALS.

ART. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorized by their respective Governments, and duly authorized and published.

STEAM VESSELS UNDER SAIL BY DAY.

ART. 14. A steam vessel proceeding under sail only, but having her funnel up, may carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

III.—SOUND SIGNALS IN FOG, ETC.

PRELIMINARY.

ART. 15. All signals prescribed by this article for vessels under way shall be given:

1. By "steam-vessels" on the whistle or siren.
2. By "sailing-vessels" and "vessels towed" on the fog horn.

The words "prolonged blast" used in this article shall mean a blast of from four to six seconds' duration.

A steam-vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn; also with an efficient bell. A sailing-vessel of twenty tons gross tonnage or upward shall be provided with a similar fog horn and bell.

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* *Resolved*, That all coal boats, trading-boats, produce boats, canal boats, oyster boats, fishing boats, and other water craft navigating any bay, harbor, or river, propelled by hand power, horse power, sail, or by the current of the river, or which shall be moored in or near the channel or fairway of any bay, harbor, or river, shall carry one bright white light forward, not less than 6 feet above the rail or deck.

Rafts of one crib and not more than two in length shall carry one bright white light on a pole not less than twelve feet high; three or more cribs in length, shall carry one white light at each end of the raft at the same height. Boom rafts with cross binders towed ahead of steamers on the Mississippi and Ohio rivers, and other waters flowing into the Gulf of Mexico, and on the Red River of the North, shall carry a white light *twelve feet high* at the forward end of the raft, and one such light at each side midway between the forward and after end.

Rafts of more than one crib abreast shall carry one white light on each outside corner of the raft, making four lights in all. Bag or boom rafts navigating or anchored in the fairway of any bay, harbor, or river shall carry a white light at least twelve feet high at each end of the raft, and one of such lights on each side midway between the forward and after end.

Rowboats shall carry one white light two feet above the stem.

JAS. A. DUMONT,
Supervising Inspector General,
President Board of Supervising Inspectors.

Approved, February 16, 1891.

A. B. NETTLETON,
Acting Secretary.

In fog, mist, falling snow, or heavy rain-storms, whether by day or night, the signals described in this article shall be used as follows, namely:

STEAM VESSEL UNDER WAY.

(*a*) A steam-vessel under way shall sound, at intervals of not more than one minute, a prolonged blast.

SAIL VESSEL UNDER WAY.

(*c*) A sailing-vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack, one blast; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

VESSELS AT ANCHOR OR NOT UNDER WAY.

(*d*) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

VESSELS TOWING, ETC.

(*e*) A steam-vessel when towing shall, instead of the signals prescribed in subdivision (*a*) of this article, at intervals of not more than one minute, sound three blasts in succession, namely, one prolonged blast followed by two short blasts. A vessel towed may give this signal and she shall not give any other.

RAFTS OR OTHER WATER CRAFT.

(*f*) All rafts or other water craft, not herein provided for, navigating by hand power, horse power, or by the current of the river, shall sound a blast of the fog horn, or equivalent signal, at intervals of not more than one minute.

SPEED IN FOG.

ART. 16. Every vessel shall, in a fog, mist, falling snow, or heavy rain-storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam-vessel hearing, apparently forward of her beam, the fog-signal of a vessel, the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

IV.—STEERING AND SAILING RULES.

PRELIMINARY.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SAILING VESSELS.

ART. 17. When two sailing vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is closed-hauled.

(*b*) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the vessel which is to the windward shall keep out of the way of the vessel which is to the leeward.

(*e*) A vessel which has the wind aft shall keep out of the way of the other vessel.

STEAM VESSELS.

ART. 18. RULE I. When steam-vessels are approaching each other head and head, that is, end on, or nearly so, it shall be the duty of each to pass on the port side of the other; and either vessel shall give, as a signal of her intention, one short and distinct blast of her

whistle, which the other vessel shall answer promptly by a similar blast of her whistle, and thereupon such vessels shall pass on the port side of each other. But if the courses of such vessels are so far on the starboard of each other as not to be considered as meeting head and head, either vessel shall immediately give two short and distinct blasts of her whistle, which the other vessel shall answer promptly by two similar blasts of her whistle, and they shall pass on the starboard side of each other.

The foregoing only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own, and by night to cases in which each vessel is in such a position as to see both the side-lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course, or by night to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light or a green light without a red light is seen ahead, or where both green and red lights are seen anywhere but ahead.

RULE III. If, when steam-vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam-whistle.

RULE V. Whenever a steam-vessel is nearing a short bend or curve in the channel, where, from the height of the banks or other cause, a steam-vessel approaching from the opposite direction can not be seen for a distance of half a mile, such steam-vessel, when she shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam-whistle, which signal shall be answered by a similar blast, given by any approaching steam-vessel that may be within hearing. Should such signal be so answered by a steam-vessel upon the further side of such bend, then the usual signals for meeting and passing shall immediately be given and answered; but, if the first alarm signal of such vessel be not answered, she is to consider the channel clear and govern herself accordingly.

When steam-vessels are moved from their docks or berths, and other boats are liable to pass from any direction toward them, they shall give the same signal as in the case of vessels meeting at a bend, but immediately after clearing the berths so as to be fully in sight they shall be governed by the steering and sailing rules.

RULE VIII. When steam-vessels are running in the same direction, and the vessel which is astern shall desire to pass on the right or starboard hand of the vessel ahead, she shall give one short blast of the steam-whistle, as a signal of such desire, and if the vessel ahead answers with one blast, she shall put her helm to port; or if she shall desire to pass on the left or port side of the vessel ahead, she shall give two short blasts of the steam-whistle as a signal of such desire, and if the vessel ahead answers with two blasts, shall put her helm to starboard; or if the vessel ahead does not think it safe for the vessel astern to attempt to pass at that point, she shall immediately signify the same by giving several short and rapid blasts of the steam-whistle, not less than four, and under no circumstances shall the vessel astern attempt to pass the vessel ahead until such time as they have reached a point where it can be safely done, when said vessel ahead shall signify her willingness by blowing the proper signals. The vessel ahead shall in no case attempt to cross the bow or crowd upon the course of the passing vessel.

RULE IX. The whistle signals provided in the rules under this article for steam-vessels meeting, passing, or overtaking, are never to be used except when steamers are in sight of each other, and the course and position of each can be determined in the daytime by a sight of the vessel itself, or by night by seeing its signal lights. In fog, mist, falling snow, or heavy rain-storms, when vessels can not so see each other, fog-signals only must be given.

TWO STEAM VESSELS CROSSING.

ART. 19. When two steam-vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

STEAM VESSEL SHALL KEEP OUT OF THE WAY OF SAILING VESSELS.

ART. 20. When a steam-vessel and a sailing-vessel are proceeding in such directions as to involve risk of collision, the steam-vessel shall keep out of the way of the sailing-vessel.

COURSE AND SPEED.

ART. 21. Where, by any of these rules, one of the two vessels is to keep out of the way, the other shall keep her course and speed.

CROSSING AHEAD.

ART. 22. Every vessel which is directed by the rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

STEAM VESSEL SHALL SLACKEN SPEED OR STOP.

ART. 23. Every steam-vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

OVERTAKING VESSELS.

ART. 24. Notwithstanding anything contained in these rules, every vessel overtaking any other shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side-lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel can not always know with certainty whether she is forward of or abaft this direction from the other vessel she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

NARROW CHANNELS.

ART. 25. In narrow channels every steam-vessel shall, when it is safe and practicable, keep to that side of the fair-way or mid-channel which lies on the starboard side of such vessel.

RIGHTS OF WAY OF FISHING VESSELS.

ART. 26. Sailing-vessels under way shall keep out of the way of sailing-vessels or boats fishing with nets, or lines, or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fair-way used by vessels other than fishing-vessels or boats.

GENERAL PRUDENTIAL RULE.

ART. 27. In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

SOUND SIGNALS FOR VESSELS IN SIGHT OF ONE ANOTHER.

ART. 28. When vessels are in sight of one another a steam-vessel under way whose engines are going at full speed astern shall indicate that fact by three short blasts on the whistle.

PRECAUTION.

ART. 29. Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

ART. 30. [See page 236.]

DISTRESS SIGNALS.

ART. 31. When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

In the daytime—

A continuous sounding with any fog-signal apparatus, or firing a gun.

At night—

First. Flames on the vessel, as from a burning tar barrel, oil barrel, and so forth.

Second. A continuous sounding with any fog-signal apparatus, or firing a gun.

ADDITIONAL RULES.

SEC. 2. That the supervising inspectors of steam-vessels and the Supervising Inspector-General shall establish such rules to be observed by steam-vessels in passing each other and as to the lights to be carried by ferry-boats and by barges and canal-boats when in tow of steam-vessels, not inconsistent with the provisions of this Act, as they from time to time may deem necessary for safety, which rules when approved by the Secretary of the Treasury, are hereby declared special rules duly made by local authority, as provided for in article thirty of chapter eight hundred and two of the laws of eighteen hundred and ninety. Two printed copies of such rules shall be furnished to such ferry-boats and steam-vessels, which rules shall be kept posted up in conspicuous places in such vessels.

PENALTY.

SEC. 3. That every pilot, engineer, mate, or master of any steam-vessel, and every master or mate of any barge or canal-boat, who neglects or refuses to observe the provisions of this Act, or the regulations established in pursuance of the preceding section, shall be liable to a penalty of fifty dollars, and for all damages sustained by any passenger in his person or baggage by such neglect or refusal: *Provided*, That nothing herein shall relieve any vessel, owner, or corporation from any liability incurred by reason of such neglect or refusal.

SEC. 4. That every vessel that shall be navigated without complying with the provisions of this Act shall be liable to a penalty of two hundred dollars, one-half to go to the informer, for which sum the vessel so navigated shall be liable, and may be seized and proceeded against by action in any district court of the United States having jurisdiction of the offense.

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